

Thursday, April 29, 1982

## Burroughs, NCR defy depressed US market

by Kevan Pearson  
A STRONG dollar on the international exchanges continues to depress the financial performance of the American computer industry, though one or two companies are going against the trend.

The majority of US-based mainframe manufacturers have now reported their first quarter figures. Of these Burroughs, so recently in severe financial straits, showed the most hope with sales up 31% at just under \$990,100,000, and profit before tax of just over \$43.7 million, an increase of 11%.

Net profit fared better, up 22% at \$27.1 million, but this reflects a lower tax charge due to last year's poor performance.

NCR reports first quarter net profits of \$30.63 million, up 11% over the same period last year. Sales rose by 3% to \$754.6 million.

Sales outside the US dropped by 4%, says NCR chairman William Anderson, largely because of the strength of the dollar. Domestic sales were up 11%.

Honeywell saw its net profit increase by 2% in the first quarter to \$55.5 million, against an inflation rate of between 2% and 2.5% for the quarter. However, the figure also contains an extraordinary item of \$36.6 million from the sale of Honeywell's share in the service bureau Geisec to General Electric, so the company's performance was well down on the same period in 1981.

The outlook is bleak, according to Honeywell's chairman Edson Spencer. "Second quarter earnings are also likely to fall below 1981," he said.

On the peripherals side there are conflicting tales from Control Data

(CDC) and Storage Technology (STC). STC continues in its path from strength to strength with a 44.3% rise in sales for the first quarter at \$262.4 million, pre-tax profits up 55.7% at \$28.8 million and net profits higher by 57.6% at just over \$18 million, all compared with the same quarter in 1981.

Control Data, on the other hand, saw its information services slip almost 33% to \$31.1 million, on sales up just under 10% to \$791.7 million.

STC's profit margin is considerably healthier than CDC's. STC returns just under 11% on sales, before tax, while CDC can only manage 3.9%.

Apple Computer and Wang Laboratories, both darlings of Wall Street for their massive annual growth rates, continue to show spectacular gains, but there are signs that growth is flattening out.

Apple reported first quarter sales up 66% to \$131 million, with profits rising 51% to \$13.8 million, compared to first quarter 1981.

Wang saw its third quarter sales rise by 40.2% to \$297.6, while profit rose 44.6% to \$17.6 million.

Company	Sales	Change	Net Profit	Change
IBM	\$7.07bn	9.4%	\$768.0M	5.2%
Burroughs	\$990.1M	31%	\$27.1M	22%
NCR	\$754.6M	3%	\$30.63M	11%
Honeywell	\$1.261bn	4%	\$55.5M	2%

Comparative first quarter results.

## 'Bring R&D North'

STRONG incentives will be placed before high technology electronics companies to encourage them to establish research and development facilities in Scotland. Following a review of its electronics support strategy, by management consultants Booz Allen and Hamilton, the Scottish Development Agency (SDA) is to shift emphasis away from financial incentives and concentrate on the university-related research capability the region can offer.

First phase of the SDA's strategy for electronics industry support has been successful. Over 5,500 jobs have been created since 1979 by the expansion of existing multi-nationals and home-grown electronics companies.

In addition about 25 new electronics companies have set up in Scotland since the SDA launched its electronics strategy.

In the light of the report, the SDA will be mobilising university-based research capabilities.

## Commodore takes 16-bit challenge

by Robert Parry  
COMING out of the eight-bit world for the first time, Commodore has unveiled a machine to take on the 16-bit IBM Personal Computer. At the same time it has released eight-bit machines which will undercut mass market rivals like Apple and Tandy and hot up price competition lower down in the microcomputer market.

The basic version of its new top end micro, due here in September and costing about £1,600, is pitted against the Apple III. Called the Commodore 720, it weighs in with 256K RAM expandable to over 750K. That compares with Apple's soon to be introduced 256K maximum version. The 720 has twin built-in floppy drives interfaced to the main board using direct memory access for speed.

But it is the split bus architecture of the 720 that opens up new areas for Commodore. As well as the eight bit 6509 processor - a development of the 6502 processor that powers Apples, Pats and various other personal computers - there is a slot for a second processor board to be installed.

The 6509 will handle I/O operations while the second processor looks after running the application programs.

By plugging in a board carrying an 8088 processor, the 720 moves up into the pseudo 16-bit market.



Transatlantic capacity for computer data, telex messages, and telephone calls will be boosted by more than 50% with the installation of a 3295 nautical mile long cable to link Europe, the US and Canada. British Telecom crews are shown landing the UK end. Total cost will be £100 million, with £30 million to be spent in the UK with Standard Telephone and Cables.

## CIS Cobol for IBM Personal

by Maggie McLening  
UK SOFTWARE house, Micro Focus has signed an agreement with IBM to provide application development tools for the IBM Personal Computer, in the US and the UK.

Micro Focus has announced its CIS Cobol, its Ansi '74 model version of Cobol for microcomputers, is to be implemented on the IBM machine in May this year, running under the standard OS/2 operating system.

Other Micro Focus products to follow shortly, such as Level II Cobol, the mainframe-oriented Cobol compiler, and Form-1 screen formatter and source code generator.

The recently announced coding tool Cobol Animator, which allows a programmer to watch real-time execution of Cobol source code, will also be available.

Micro Focus sees the addition of these development tools as a significant addition to the IBM Personal Computer. "The combination of Cobol Animator and Level II Cobol turns the IBM PC into an extremely effective programming workstation for developing and maintaining Cobol programs," says Peter Hewitt, the company's marketing manager.

First distributor of the package in the UK is Microcomputerland, the wholesale branch of Gemini Developments in Farnborough. It is not selling its Personal Computer in the UK yet, but Microputerland is importing it from the US.

Cobol Animator, Level II Cobol and Form-1 are available on OEMs, and will be shortly single users.



Commodore 720.

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## ICL lands £20m major orders

by Kevin Cahill  
ICL picked up two huge orders this week and at the same time announced significant enhancements to the existing mid-range ME29 computer.

One of the orders stands among the biggest ever won by ICL overseas. It is worth an estimated £20 million for a delivery to the Emporium Holding Group in Singapore.

The Emporium Holding Group is the parent of one of South-East Asia's largest trading groups, with sites in Singapore, Hong Kong, Malaysia, Brunei and

orders, which are expected to be worth £10 million in total, will improve ICL's commitment to and standing in the banking world.

BACS, which is operated jointly by the five main UK clearing banks, already has six large ICL 1900 and 2900 machines.

The new project, centred around the recently installed ICL 2966 at Dunstable, will involve a real time service based on a series of ICL DRS 20 terminals connected to the 2966.

The latest additions to ICL's best-selling ME29 range are designated the 34 and 29 and represent a top-end machine which is 1.8 times as powerful as the existing ME29 Model 45, and a low entry machine (the 29) which will be supplied, complete with three quarters Mbyte of main memory, two 35 Mbyte disc drives, a matrix printer, four workstations and communications coupler, for under £40,000.

First deliveries of the new system are due in November 1982. The new hardware will come with a range of software options, including the Associated Systems Architecture, to provide remote access facilities for the ME29s when they are linked to IBM mainframes.

## INSIDE THIS WEEK'S ISSUE

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## IBM to give preferential treatment to 3081 users

# More delay on IBM's big disc drive

by Kevan Pearson  
MANY IBM sites will remain starved of the long-overdue 3380 disc drive when deliveries start soon.

IBM intends to start delivering in Europe this summer, but it intends to give preferential treatment to users of its big 3081 machines at the expense of smaller sites.

IBM originally intended to supply about 15,000 3380 units in Europe in the first year of availability. This has now been reduced to about 4,000 following manufacturing difficulties. This means that 3380s could still be in short supply, especially since IBM is to give priority to the 3081.

Martin Ginger, European marketing manager for disc systems at Storage Technology, says that IBM has dropped its sequential purchasing policy on 3380s, to make them available to 3081 users.

Abe Hasson, peripherals marketing director at National Advanced Systems, says IBM is giving 3081 users 'preferential allocations' of 3380s, provided they can justify the need for large disc systems.

This should not be difficult for many 3081 users following the per-

formance problems some users have experienced with the 3081D. IBM's Montpellier plant, where European 3081s are being made, has an annual capacity for 1,000 systems. If 3081 users are to get priority on 3380 deliveries, it is clear that there will not be many of the estimated 4,000 3380s available for smaller machines.

Both STC and Memorex have announced the intention of supplying 3380 type products, though so

far only STC has announced an actual product. Mike Kitching, Memorex UK managing director, said that Memorex expects to announce its product plans soon, with the intention of commencing deliveries before 1983.

The other company which has announced a product for this market is Ibis, which unveiled its Ibis 5000 in March. This was formed by a group of ex-Memorex and ex-STC people, and STC has issued a writ against Ibis alleging patent infringements. Ibis had hoped to start shipping the five-gigabyte Ibis 5000 system towards the middle of 1983. It now looks as though it could be delayed.

Meanwhile IBM is already shipping 3370 and 3375 disc systems to the UK. The 3370 is aimed at DOS/VSE systems while the 3375 is an intermediate system between the 3350 and 3380 for large installations. Both use the same thin film read/write head technology employed in the 3380, both ran into the same problems.

The main problems were chlorine contamination of the sealed disc unit, and secondly, especially on 3370s, a proliferation of head crashes after the discs had been started following being switched off for any length of time.



GINGER... IBM has dropped sequential purchasing policy.

## Japan chip surprise

by Kevin Cahill  
THE Japanese have once more taken the semiconductor business by surprise with news that two companies plan to start almost immediate deliveries of one Mbit ROM chips.

The announcements came separately from Nippon Electric Company and Oki, both of which have headquarters in Tokyo and marketing operations worldwide.

Before this announcement the furthest advance in the field was seen to lie with Hitachi, which is promising deliveries of a 256 Kbit ROM chip this quarter.

US companies in the market are still generally supplying 128 Kbit devices, and are unlikely to have matched Hitachi's 256K chip before the autumn.

The Oki announcement did not include any detailed information,

but NEC has said that it will start test marketing the one Mbit ROM in two months' time.

Oki is expected to make its first deliveries later that month, or early in July.

Industry sources expressed surprise at the announcement, but many recent Japanese microcomputers have appeared with plugs for ROM cards to carry conventional application software.

Also, the latest Commodore 720 microcomputer and the 510 which is due for delivery in September, are supplied with hard plugs, although no board announcements have been made.

The trend towards board and ROM-based application software carriers would create just the market needed to pay for volume production of one Mbit chips, which could cost up to £30 each unless produced in quantities over 5,000.

## NEWS BRIEF

### Standalone micro soon from DEC

THE long-awaited standalone microcomputer from mini manufacturer DEC is nearly here. Units were on private show to selected customers at last month's Hannover Fair and the machine is to have its worldwide launch on May 10. DEC already has an entry into the personal computer market, increasingly important to mini and mainframe companies, with its single board upgrade which converts the V1100 terminal into a microcomputer running CP/M.

### Fund pays out

MICROCOMPUTER software house Systematics is the first company to benefit from the establishment of the £10 million AFA Venture Capital Fund by US investment managers Alan Patrick Associates. The fund has now been fully subscribed by 20 investors including Citibank and Honeywell Pension Trustees, and its objective is to invest in high growth UK companies.

### Business system

SEMICONDUCTOR house Intel has introduced a general-purpose commercial system for business applications. The company will supply the transaction processing system (TPS) as a building block for system builders.

### Taking control

MEMOREX is taking control of all disc production at Burroughs. Memorex will control Burroughs' disc plants and will make its products available to Burroughs, thus giving Burroughs users access to high capacity Memorex 3652 type discs for the first time. Burroughs acquired Memorex last year.

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THE ADVANCED TERMINAL FOR ICL AND IBM

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# London PO workers join Mercury protest

by Donald Kennett  
FURTHER union opposition to Mercury Communications' rival to the British Telecom network has come from the London City branch of the Post Office Engineering Union, which lobbied the union's head office last week after circulating other branches for support.

A campaign to prevent the start-up of Mercury was launched last month by Liverpool Internal branch with a fighting fund of over £1,000.

The meeting, held in the POEU's car park, heard general secretary Bryan Stanley say that the national executive had decided to take any action necessary to oppose the connection of Mercury to British Telecom's network and any further liberalisation of telecommunications.

Liverpool Internal branch secretary Phil Holt, who is also chairman of the British Telecom Union Committee (formerly the Council of Post Office Unions), said there was almost unanimous approval for the campaign of opposition to Mercury among BT staff unions.

Discussions were being held on finances for meetings, advertising and other aspects of the campaign and on co-ordinating it into more widespread opposition to privatisation generally.

On the other hand, the POEU supports the government's proposed wideband cable network which is designed to carry cable television as well as two-way telecommunications services, provided that it is controlled by BT and installed by its members.

A spokesman for Mercury said the consortium was worried about union opposition, but was trying to keep out of politics as it had done all along.

Nobody is volunteering to put the government's and private industry's case to union members.

Our Parliamentary correspondent adds: The Post Office Engineering Union has been disturbed by leaks that the Home Office intends to ignore the Dept of Industry's desire to provide a modern system of cable. Instead it will approve a patch-up system in the interests of Visionhire and Rediffusion, one of the union's sponsored MPs, John Golding stated in the Commons.

But Kenneth Baker, Minister for Information Technology, said that rumours were unfounded.

## DP book wins prize

TRACY KIDDER, author of *The Soul of a New Machine*, has won the Pulitzer Prize for non-fiction.

His book is based on observations of the day-to-day working environment at Data General's Westborough headquarters in Massachusetts where an unofficial research team plots to bring out a 32-bit minicomputer ahead of the official research team, and wins.

The film company Columbia has taken out a one-year option on the book with the right to renew the option for another year.



KIDDER... Pulitzer Prize

## £10m govt boost for software

by Maggie McLening  
AS promised in the last Budget, the government is to give a £10 million cash injection to revitalize its Software Products Scheme over the next three years.

Kenneth Baker, Minister for Information Technology, has made it clear that in addition to the latest funding the project is to be given a new look and a sharper definition of its objectives.

Although the scheme will continue to be administered by the National Computing Centre (NCC), it will be guided by an advisory committee drawn from the computer industry, including three members of the CSA Software Products Committee.

Brian Cudby, operations director of BIS Software, is to be chairman of the advisory committee, aided by David Roberts of RTZ Computer Services and Dr Robert Worden of Logica.

Other committee members are Eric Howe of the National Computer Users' Forum; David Elise of the NCC; Nicolas Bernard and Tom Fleming of the Department of Industry; and Dr Douglas Eyslon, director-general of the CSSA.

No ceiling has officially been set for the maximum amount a company may receive. Allocation of the funds has been divided up over the three years into £3.6 million for 1982-3 (which includes £1.6 million unused in 1981-2), £4 million for 1983-4 and £5 million for 1984-5.



LINDOP... "Long list of government hesitations and prevarications."

## Lindop joins outcry on privacy White Paper

by Kevan Pearson

SIR Norman Lindop, chairman of the committee which advised the last Labour administration on data protection, has joined the growing list of critics of the government's White Paper on plans for data protection legislation.

Sir Norman, in an address to the fourth annual Grace Hopper Lecture at Thames Polytechnic, described the White Paper as "the latest in a long list of government hesitations and prevarications" on the subject.

He said that the White Paper, which takes only seven and a half pages to set out the need and proposals for legislation was "very sketchy". He is very concerned about the potential number of exemptions from control which the White Paper allows.

Sir Norman described the public sector as representing the main danger as far as privacy is concerned, because of the massive

amount of sensitive data held about individuals in manual and computer systems.

He added that while the right of access to information was not "universally applicable", that does not mean that public sector organisations should be allowed to use computers indiscriminately, without any external control.

He repeated the call made in the Lindop Committee report for codes of practice governing the use of all computer systems.

He said that most people had "an ambivalent attitude" to the security forces, and the situation would not be helped if there were widespread exemptions in the security forces' use of computers.

Sir Norman believes that the data protection authority should have at least one person with security clearance, so that police and national security systems do not fall outside the ambit of the legislation.

## Design award for ZX81

by Kevin Cahill

A DESIGN Council award has capped a good year for Cline Sinclair and his company, Sinclair Research.

Sinclair's ZX81 microcomputer, which won the award, has now chalked up over 400,000 sales; he has just launched the Spectrum, a colour personal computer, and a few months back he made a major deal with ICL for the sale of mini terminals.

Later in the year a group of City

institutions plans to buy 10% of Sinclair Research and is expected to offer anything from £2 million to £5 million for the stake.

Sinclair is no stranger to the Design Council Awards. He picked up awards for his executive calculator in 1973, the Sovereign pocket calculator in 1977 and the Microvision pocket TV in 1978.

Mullard was the other information technology company to win a Design Council Award for a microprocessor.

## NEWS BRIEF US, Japan set up high tech study

THE US and Japan have set up a working group to study differences in high technology trade issues. The US is easier access to Japan for high technology products while Japan is looking for more joint research projects between Japanese companies.

The idea of the working group was proposed by the Japanese trade minister in January.

### Rair micro

MICROCOMPUTER manufacturer and peripheral maker Rair is to market the Rair personal computer. The joins peripherals and the Rair's Texas Instruments, Hazeltine and Diabla in the Rair division. The Rair machine starts at £1,790.

### More memory

GOULD SEL has extended 32/87 range of 3.7 mips minis to higher memory capacity.

The new packages will be as the 32/8720 models and RAM chips for one Mbyte costing £175,000 and £100,000 depending on the size of the module used, and a two Mbyte model for £175,000.

Imports of Japanese computer products must be limited by an array of regulations to supplement those already in force.

### Support service

A SUPPORT service for IBM's Copsics production system is to be provided by tergo. The service covers system, systems engineering, installation and implementation of Copsics software, and conversion of existing systems. It is offered by UK Copsics installations.

### Software source

RANK Xerox has secured a list of software packages for its microcomputer and 8800 microprocessor. The deal is a Munich-based Micro-Pro has launched the first German version of its Wordstar word processing package. The three-year agreement results in products being available in 10 languages in Germany and Australasia.

### Adabas-VAX

DATABASE system Adabas is available in the UK for VAX minicomputers by the year from Adabas Software (ASL), of Derby. Adabas is currently being developed by German software house Spec AG, which also produced the system now running on DEC PDP-11s.

### CHILVER

CHILVER... procurement policy must help companies to develop "international" products.

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## The French and UK electronics industries ask for a survival plan

## Counter-attack after 'Japanese invasion'

by Jack Gee

FRANCE's computer and electronics industry has submitted what it calls a "survival plan" to the government as a counter to the invasion of Japanese products.

Describing itself as "the world's number four power" in computers and electronics, the French Electronic Industries Group points out that these products accounted for over one third of France's trade deficit in 1980.

The group said the deficit in this field between France and Japan has been growing annually since 1979 at a rate of FF11 billion (£100 million) a year, rising from FF13 billion to FF14 billion in 1981.

The French manufacturers said: "The only way to beat the Japanese is to adopt similar methods and a similar philosophy."

The group urged that France must copy Japan's trade protection methods by introducing "safeguard procedures of the same type as those which have succeeded so well in Japan."

Imports of Japanese computer products must be limited by an array of regulations to supplement those already in force.

The group said: "If the Japanese refuse, strict import quota measures must be introduced for computer products in the same manner as those already imposed upon cars."

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France, which is now the world's third ranking exporter of electronic and computer products and in the forefront for software, must launch an assault on Japan's domestic market, the group said.

The French computer industry refuses to let its exports to Japan represent only six per cent of Japanese sales to France. We demand an increase in our technological and trade presence in Japan and a complete range of government aid to exports.

The manufacturers added: "But the best means of pressure which France can exercise is to limit the opening of our frontiers to Japanese products in proportion with French exports to Japan."

The industrialists said that French sales to Japan must be raised from a current six per cent to twenty per cent of Japanese sales to France over the next ten years, with an annual rate of increase of seven per cent.

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# Peachtree set to take on Apple, Osborne in UK

by Maggie McLening

SOFTWARE supplier Peachtree is planning an all-out attack on the Apple and Osborne microcomputer market.

Although it is one of the biggest suppliers of software for the Apple in the US, Peachtree, part of Management Science America, has until now left the UK market alone.

Managing director John Hale said that at first there appeared to be too much competition here, but that his views had changed radically since the UK operation was set up in December last year.

"Although there is a lot of software available, most of it is absolute rubbish because there is more to a package than just a program. Plenty of companies have written good programs, but underestimated the importance of debugging, stability, documentation and marketing," he explained.

September will see the launch of a complete range of software for the Apple and Osborne machines, including integrated ac-

counting packages and word processing. In the US, Osborne will be "bundling" Peachtree software as it is currently doing with standard packages such as Wordstar, but in the UK Peachtree will remain independent to sell to individual Osborne dealers.

The software for the UK will be anglicised versions of the packages now selling in the US, written in MBASIC. Peachtree has other plans for the Apple III machine as soon as a CIS Cobol compiler is announced.

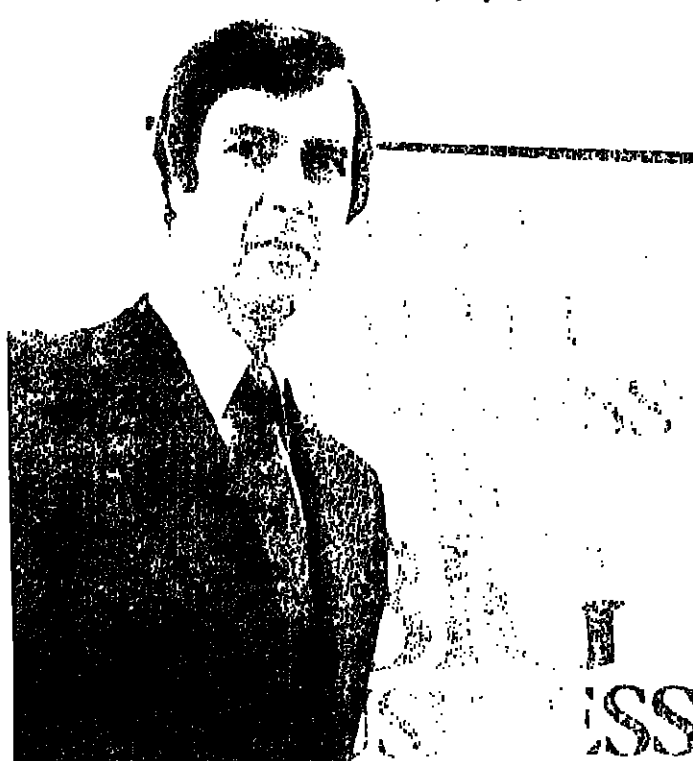
Peachtree has bought software house CSA Microsystems of Gerards Cross, and with CSA has come a complete range of accounting packages written in CIS Cobol as well as a 20-strong user base. The name of the company is to be changed to Peachtree Business Management Systems, and it is to continue developing CIS Cobol programs under Peachtree's influence, according to Hale.

"The demand for Cobol programs on micros is enormous," he said.

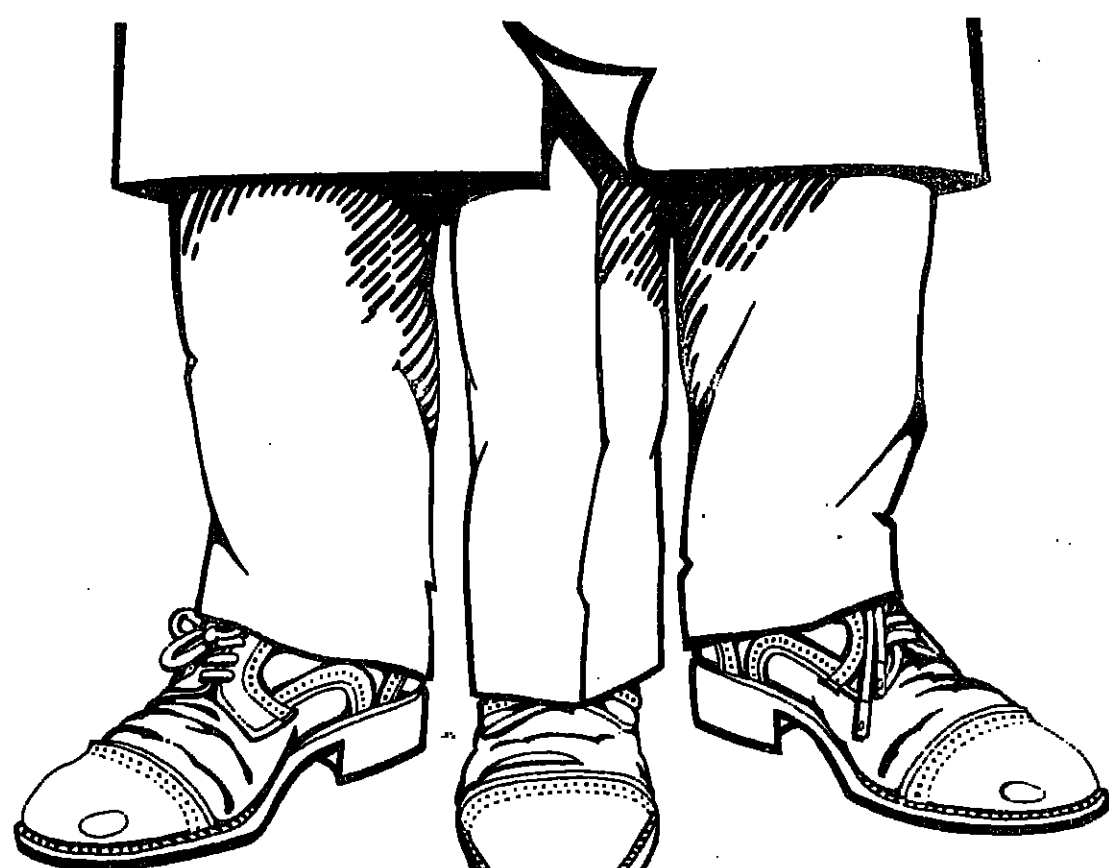
so we decided we needed to acquire some for business reasons," commented Hale.

His opinion was echoed by Nigel Hearn, product manager for Apple III at Microsense, the leading Apple dealer in the UK.

"Although the range of software for the Apple III is picking up nicely, this move by Peachtree can only do us good. The sort of feedback that I'm getting from dealers is that customers would like more of a choice of software, so an increase is certainly going to boost sales," he said.



HALE... "Demand for Cobol on micros is enormous."



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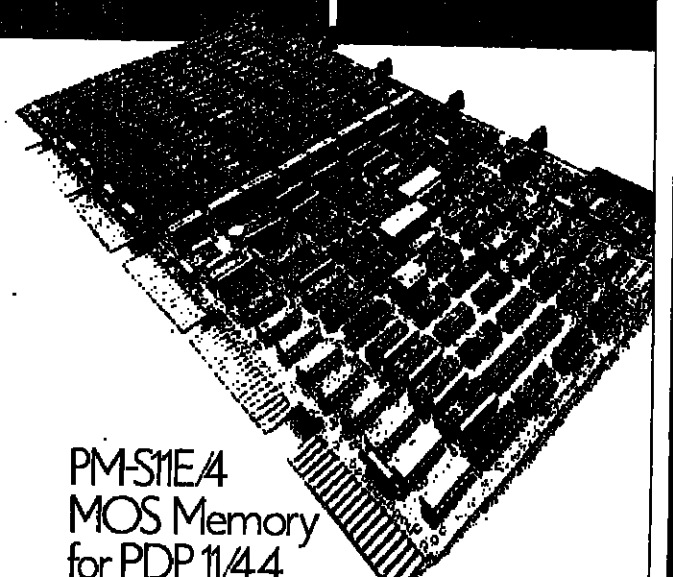
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JARMAN... Hopes for increased access involvement.

## Govt arm backs OCR

by Boris Sedacca  
THE unimpressive market record of optical character recognition technology looks set for a temporary improvement.

The Central Computer and Telecommunications Agency, the government's computer buying arm, has issued guidance to government departments to look at mixed-media OCR and key-to-disc data entry equipment.

OCR technology perpetuates the technologically unglamorous market for batch processing. But in the case of government departments it is a better method than online teleprocessing for the large quantities of "turnaround" forms such as gas bills and tax demands which have to be processed.

OCR Scandata is hoping to grab a slice of this market, using the Ministry of Defence as a reference site. An alphanumeric handprint reading system was installed last September at the Defence Codification Data Centre at RAF Hullavington, near Swindon, where it processes up to 7,500 A4-sized stock control forms a day.

But according to Colin Jarman, managing director of OCR Scandata, the commercial market for OCR is also growing, particularly in banks, building societies and insurance companies. He said: "Access currently uses our equipment for payment vouchers and we are hoping to interest them in trials on sales vouchers. We are also talking to Barclaycard."

## 'Eurotechnique should lead French plan'

by Jack Gee  
EUROTECHNIQUE, the partnership between National Semiconductor and France's recently nationalised Saint Gobain conglomerate, is claiming leadership of the French government's new five-year computer components plan whose details are to be announced in July.

Jean-Luc Grand-Clement, managing director of Eurotechnique, said his organisation should be chosen in preference to the Thomson-Motorola and Matsushita alliances for this key role.

Grand-Clement said: "National

Semiconductor is not necessarily the world's best manufacturer of integrated circuits. But it is the only one which is genuinely ready to co-operate."

"The others are concerned only about earning as much money as possible while giving away a minimum amount of technology."

The Eurotechnique chief expressed concern about the government's decision that Saint Gobain, which is the major partner in CII-Honeywell Bull as well as holding a 51% stake in Eurotechnique, must withdraw from the computer industry.

## Laser storage rivals prepare for battle

by Kevin Pearson  
LEADING suppliers of disc technology are forming their battle lines in anticipation of a rapid growth in the market for laser-based optical storage devices.

Two rival, but related technologies, have emerged. The major difference between them is that one actually burns holes in a metallic layer on an optical disc, while the other heats the metal up to create a blister of expanded gas to serve the same purpose as the hole.

Both techniques have major companies backing. The "hole" technique is supported by a joint venture between Control Data, the second largest manufacturer of computer media in the world, and Philips, the Dutch electronics giant. It is also being backed by one of the pioneers in laser optical data recording, Drexler Technology of Mountain View, California.

Drexler is not well known outside its American market, but it pioneered the use of laser readable tape for computer systems to replace conventional magnetic tape. A single reel of tape can hold up to 50 gigabytes of data.

The other type of optical disc is being supported by another joint venture between office equipment manufacturer Xerox and the French electronics combine Thomson-CSF. It is also being developed by Shugart Associates, the Xerox subsidiary which initiated the 5¼" "mini" Winchester type disc.

Both factions claim particular benefits for their type of recording, but until production models are available it will be impossible to make verifiable claims for either system. And the CDC-Philips venture does not expect to have a marketable product until

next year.

The two great advantages claimed for optical discs over conventional media are the massive volumes of data - with bit densities up to 100 times those available with magnetic media, says Shugart - and the lower risk of mechanical failure. The read/write head is about 100 microns (one micron = a billionth of a millimetre) above the disc, as opposed to less than one micron for thin film heads on conventional discs.

On the negative side, the discs are non-erasable, but space can be left available on the disc for updates and changes.

The major manufacturers do not see the optical disc as a direct rival for magnetic media. Its main use will be in archival applications, for backing up conventional storage and in the "office of the future" to replace paper files.

## Aregon to sell itself

by Donald Kennett

AREGON International's overseas success with viewdata software sales - they reached £2 million last year after doubling for three years - has led it to begin its own marketing in the UK.

Managing director Anthony Chandor said that Systems Designers, which developed the IVS-3 viewdata system and has been marketing it in the UK for Aregon, would continue to provide a viewdata application support and development service and to implement specials for Aregon, but would no longer market the IVS-3 as a system.

Aregon has set up its own development centre in South London.

SDL's viewdata marketing manager Ian Taylor said the relationship between the two companies was now much less tight and purposeful than it had been while viewdata was a relatively unknown thing. Each would sell the other's products on a royalty basis.

Although SDL developed the IVS-3 private viewdata system and the gateway for Germany's trial public service viewdata system under contract to Aregon, Aregon was now developing the gateway for IVS-3 itself. SDL will use it as a component in its turnkey systems. Taylor expects Aregon to reciprocate by selling SDL's new Publish-R database management system for viewdata.



The Panasonic hand-held computer.

## 'Total' hand-held system

by Kevin Cahill

A HAND-HELD computer weighing 1½lb and complete with a suite of application software packages was launched on the European market at Hannover Fair.

Not much bigger than a pocket calculator, the Panasonic RL H1000 was shown in a variety of configurations.

Described by Panasonic as a total computer system, the H1000 has 2K of RAM memory expandable to 52K with a basic ROM chip of 16K. There are sockets for up to three further 16K ROM capsules, which demonstrates a trend, in common with other Japanese companies, towards the use of pre-programmed ROM chips instead of floppy disc or other magnetic media-based programs.

The hand-held micro comes with a limited liquid crystal display which can show about 28 characters, but the machine can be plugged into any television set made to US (or NTSC) standards. Colour graphics software is available.

The conversion to PAL television used in most of Europe is currently under way.

One of the more interesting aspects of the machine was the wide range of software available with it, most of it prepared for Panasonic in America. The principal language offering is Snap Basic, a Basic specially adapted to the operating system which drives the H1000.

The machine was launched in Germany at a base price of £350, but plans for a UK launch are still not available from the Panasonic Matsushita office in Slough. Mid-1983 is thought to be a likely date.

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## SALES BRIEF

### CAP lands £545,000 police deal

CAP has won a £545,000 contract from Durham Police to supply a network based on the Perkin-Elmer 3230s and the Milgo communications system. This will link 14 sites to headquarters and a police national computer in the don.

The contract follows three years' planning and is to be completed by autumn 1983. The system will place a teletypewriter network to provide message routing and bulletin board facilities.

## CAD for Meyer

SHADE Computer Services has won an order from Montague Meyer, the UK's largest trading company, for a CAD system based on a Gould 32/27 32-bit mini. It will be used for designing timber frame building components. The system's database will hold 3,000 items from which to produce schedules, order lists, inventory lists and manufacturing data.

## Cig machine

BRITISH American Tobacco, the third largest company in the UK, has ordered a £1 million IBM Mbyte dual processor Bumbos B6900 mainframe for its Woking headquarters. It will replace a number of smaller Burroughs Rediffusion computers and build up holding files on "key justifiable assets of the company's business".

## Rigged up

THE UK subsidiary of Ag Computer has won an order for a Domain distributed interactive system from oil platform engineering engineers John Brown & Wright. The system allows each user to run up to 16 large-scale Fortran processes concurrently and provides various shaped windows onto them, each workstation's high-resolution screen.

## £1.5m order

BRITISH Telecom has ordered nearly £1.5 million worth of equipment for its engineers. The equipment will also be used to make up comprehensive briefcase kits to support the new data services. Main items are programmable, including the Navit Superdata tester, the Tektronix 834 data analyser and the Sierra 800A test frequency test set.

## Dental data

THE Dental Estimates Board, which handles dentists' claims for payment under the National Health Service, has ordered the Kode XL40 data preparator systems to replace paper up punches for inputting data to the ICL 1904S. The installation should be complete in August and will include Kode Triplex switching devices to enable each of the 195 keystations to be connected to any of the XL40 processors.

## Non-stop system

UK resilient systems manufacturer CTL has won its fourth order for a non-stop Momentum 8066 system from the Public Health Laboratory Service Board. The system will provide all options, including momentum link, fast recovery option, mirror discs and peripheral switching.

## Stock control

SYSTEMS has sold a £200,000 Series 6700 computer to a Midlands-based electrical distributor, Coventry Factors, for a stock control system, which includes the SYSPIN monitoring and financial packages, together with other software worth £30,000, primarily for stock sales control.

## 'Telephone lines won't be good enough for IBM'

by Donald Kennett

IBM will become increasingly dependent upon wideband satellite-based communications channels to support the products it launches over the next 10 years, according to US authority Dr Dixon Doll.

Speaking at a seminar on information system strategies run by his company, DMW, Doll and his colleagues covered a range of subjects from programmerless application development to local area networks - and IBM featured prominently in most of them.

Concerning wideband networking, Doll said IBM was participating in the Satellite Business Systems venture because it needed to be sure the capacity would be there to handle transmissions between PABXs and between storage facilities.

"It has to make sure it won't have all these high-powered systems stuck with no way to get the data between locations fast enough, because users have to rely on voice grade telephone lines,"

Satellite technology had developed very rapidly in the US over the last two or three years, but the main market continued to be broadcasting, he said. Many large corporations, however, had installed satellite links for bulk data transfer and video conferencing, or in order to own their own communications links rather than renting them from a telephone company.

The usage of satellite links was very limited today but it would literally explode over the next few years, he added.

The communications products that could be expected from IBM this year included a higher performance version of the 3705 data communications controller, with between four and eight times more storage and a significantly larger throughput, and a series of local area networks designed for different specific purposes.

In the next two or three years it would launch an improved version

## Honeywell takes stake in videotex firm

by Howard Karten

A NEW videotex service in the US, probably to include home shopping, is to be launched by a recently formed company based in Chicago. Keycom Electronic Publishing will begin a commercial videotex service in mid-1983.

The latest entrant into the videotex field is a joint venture of Centel Corp, a telephone operating company, Field Enterprises Inc, a media conglomerate that publishes the Chicago Sun-Times and operates cable and broadcast TV stations, and Honeywell.

The service will rely heavily on information and databases provided by Field Enterprises. Negotiations are currently under way with several other unnamed database suppliers. The service will operate on Honeywell Series 8 hardware.

Robert Nichols, president of Keycom, emphasised that the venture was not an experiment, but rather a money-making enterprise. Part of the assets of Keycom will

be Keyfax and Nite-Owl, which are teletext services formally run by Field Electronic Publishing Inc, a subsidiary of Field Enterprises. Keyfax currently has 100 users.

The service will be priced on a usage basis, and subscribers will either rent special hardware from Keycom or use their own personal computers. Nichols emphasised that Keycom will aim at a broad market, so subscribers can choose whatever individual services they want.

Centel will hold 54% of the joint venture, Honeywell 30%, and Field, 16%. The hardware will be compatible with the supposed US standard announced last year by AT&T.

This is Honeywell's second participation in a videotex service. A Honeywell spokesman said it would be fair to characterise Honeywell's participation in Keycom as an effort to move more aggressively into the videotex field.

## Device replaces cables

by Kevin Cahill

"I DON'T ever want anyone to have to climb under the tiles of a computer centre floor again," said Henry Morgan, president of T-Bar International, at the launch of his matrix switching system onto the European market.

The virtual switch matrix device instantly reconfigures all the interconnections between hundreds of pieces of equipment, such as modems, multiplexers and front-end processors, without the need

to remake physical cable connections.

The VSM replaces an assortment of connection methods, such as cables, plugs and back-to-back multiplexers.

At a cost of \$350,000 the VSM machine is only suitable for big installations, particularly those running real time systems, but T-Bar is aiming to produce a VSM range to address the needs of smaller installations.

## AUEW membership battle

by Andrew Thomas

THE introduction of new technology, traditional bete noire of the Amalgamated Union of Engineering Workers (AUEW), is the cause of a bitter internal struggle between the moderate-dominated Engineering Section (ES) and the left-wing Technical, Administrative and Supervisory Staffs section (TASS) of the union.

TASS is already fighting to restructure the AUEW, and is engaged in a fight with the ES over which section should represent technicians on the shop floor.

Terry Duffy, president of the

ES national committee, claimed at the recent AUEW conference in Eastbourne that the ES has won the battles for representation at Plessey and Ferranti. Meanwhile, TASS has won negotiating rights at Lucas Engineering.

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DOLL... "Use of satellite links will explode in the next few years."

## Universities switch to open networking

by Donald Kennett

SOUTH-WEST Universities Regional Computing Centre has led the UK into open networking.

Last week the centre closed down the 11-year-old Control Data 1700 which had provided switching and protocol conversion facilities for links between SWURCC and the Universities of Bristol, Bath, Exeter, Cardiff, and the University of Wales Institute of Science and Technology.

In the open networking system which replaces it, standard protocols are used. The X25 international packet switching standard, and UK interim standards for higher-level functions such as transferring files, handling terminals and setting up calls, are implemented.

This is done either directly in the mainframes that are linked together, or in network interface processors based on GEC 4000 series minis which also provide local X25-based networking facilities on each site.

For the switching function, the public packet switched network (British Telecom's SwitchStream One) is used, supplemented by leased lines for the routes carrying the most traffic - 80% of the traf-

fic on the previous network was to and from SWURCC's ICL 2980.

First implementations of the higher-level protocols were on new Honeywell Multics machines installed at Bath in July 1980, based on the work of the Packet Switching Users' Forum which started in the mid-seventies.

Implementing them on the remaining machines in SWURCC's network has enabled the CDC 1700 switching computer to be removed. It also means that interconnection can easily be achieved with machines elsewhere in the country.

Implementations of the protocols written for Digital Equipment, ICL, Honeywell and GEC machines have now been circulated to other UK universities and research establishments. They will enable them to increase the benefits of sharing resources such as software, databases, support staff, processing power and storage.

The UK interim standards implemented include the Yellow Book transport service, the Blue Book file transfer protocol, the Green Book terminal handling functions and SWURCC's own job transfer protocol.

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VAX 11/780	✓	✓	—	• High speed (530 nsec cycle) • Low power (20.5w) • Replaces up to four VAX M8210 boards

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There has always been one big problem with the General Electric TermiNet 2000 series matrix printers from Zygal. It's not that they're a new breed of matrix printers, so advanced, so functional that's the problem. Their reliability has never been questioned. It's true that they are very quiet in operation, easy-to-use, easy-to-carry. The sleek clean lines complement all decors. Fewer moving parts. A choice of 60 cps and 180 cps models in either keyboard or receive-only configurations. Each with higher print quality, including descenders and underlines.

So, what has been the problem? Cost. Considering their performance, the TermiNet 2000 series matrix printers from Zygal have always been excellent value. But, now, they are available at around the same price as other more basic printers. But only from Zygal. And not for long. Send off the coupon.

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John W. ...



# Systems builder climbs from nought to £1m in two years

A BRITISH Digital Equipment OBM has achieved a rare success.

Darkcrest, a systems builder which uses DEC processors and customised software and peripherals, produced turnover of £600,000 in its first year which ended July 1981. And now it aims to hit the million mark by its second year end.

1981 profits at £62,000 were respectably above industry averages, but its six staff turned in sales four times higher than the industry average per employee in that year.

But it didn't happen without the kind of heartbreak which seems to hit every entrepreneur at least once in his career.

Nick Brackenbury, managing director of Darkcrest, had a long and successful career with DEC and Systime, before deciding to go it alone. He had a false start as a minority shareholder in a group of companies, but difficulties with the majority holder forced him to move and effectively write off two years of effort and investment.

That was the moment, he says, when he had to decide whether to go back to a company like DEC, or swallow his losses and start again.

He teamed up with fellow electronics engineer Roger Box. They had £30,000 lent by friends to buy equipment.

Box, who had been with Brackenbury for the two years leading up to the formation of Darkcrest, explained that none of the £30,000 was used to pay salaries or other expenses. "The lenders always had a line on the equipment we bought. Conversely, we had strong incentive to generate our salaries by going out and selling."

Brackenbury says that by the end of the first year, they had established a mixed user base of over 100 companies, about 25% of which represented complete systems running the "supercharged DEC computer" which is the heart of the Darkcrest offering.

The system is a PDP-11/44 control processor with 512K of

main memory and two high speed 160-Mbyte Winchester disc drives, a magnetic tape transport, multiplexer, 12 VDUs and a fast printer.

Peter Williams, the operations director, points out that Darkcrest, while always using the DEC processor and the DEC operating system RSTS, will choose the best and most economic peripherals.

Brackenbury is complimentary about the reliability of the Fujitsu Winchester which Darkcrest uses in some of its systems.

Darkcrest is based in an old building in Borough High Street, close to London Bridge. Talking about the early days of the company, Brackenbury wryly suggested that without bank facilities and with a very close connection between your income and your salary, you don't go for expensive offices, cars or furniture.

Now Darkcrest has over 160 customers, about 40 of whom have complete Darkcrest installations.

At the end of 1981 the Industrial and Commercial Finance Corporation (ICFC) purchased 20% of the company's equity.

This gave it the necessary working capital, without the burden of interest and capital repayments, for expansion.

The company will reach £1 million turnover by July 1, with profits around £82,000, says Brackenbury.

Like all companies of its size, Darkcrest is dependent on reference sites, one of which, Telemart, is in its own building.

Readers in London who listen to Capital Radio and LBC will have heard recently the ads for Telemart, the first computerised exchange and mart. Telemart is dependent on a computerised matching system linking sellers and buyers via its own operators.

Once the decision to set up Telemart had been taken, Darkcrest had four weeks to build its Record Data management-based filing system.



The Darkcrest team, Nick Brackenbury (top), Peter Williams (left), Roger Box... aiming for £1 million turnover this year.

by Kevin Cahill

## MICRO NEWS

# Eight-bitters biting back — led by Japan

EIGHT-BIT microcomputers seem to have been losing out to 16-bit machines lately, if only because the latter appear more glamorous. But the eight-biters are making a comeback, playing much on the relative dearth of application software yet available for systems built around chips like the 8086/8088 from Intel or Motorola's 68000.

There has been a particularly strong showing by the Japanese.

The UK arm of Nippon Electric, microcomputer market leader in its Japanese home base and showing strongly in the UK, has released a word processing software package called Bench-

mark which takes advantage of the colour capability of its PC8000.

NEC is also ready to put money into software development by third parties specifically for the NEC machine, says business systems assistant general manager Derek Arnold. This would add to the CP/M software base already available to the machine.

Sharp, running third in its Japanese home market, has added to

its range of 8-bit Z80-based microcomputers aimed at the home and small business user. The MZ-80A, a self-contained unit with screen, keyboard and cassette deck like other Sharp machines, comes with 48K of RAM, and will set a business user back about £2,000 for a system with floppies and printer, according to sales manager Paul Streeter. CP/M will be available on the machine.

Canon, again selling Japanese machines with keyboard, screen and mass storage (though floppy drives this time) integrated into single units, is now offering application packages such as general ledger, accounts and invoice control for business users, and mathematical and statistical packages. It has been lack of the slow sales of the Canon machines in the year since they were launched.

But Japanese manufacturers are not the only ones pushing hard on their 8-bit products. Commodore's new machines shown at the Hannover Fair, although opening up

the way into 16-bit systems via second processor options, straddled the whole range of 8-bit microcomputer applications from business systems down to games machines.

Commodore is playing on the CP/M compatibility that added Z80 boards would bring to its high-end business systems, which are based on a 6509 chip, a development of the 6502 from its own chip manufacturer MOS Technology.

The other aspect that Commodore is making much of is the pricing of its new machines, aiming hard at undercutting market rivals like the Apple II and III, and Atari 800 in mid-range 8-bit systems.

This echoes a trend from various other manufacturers. Altos recently dropped prices on its smallest 8-bit systems, the Series 5 or "Little Box", which now weigh in at around £2,200 for a twin floppy system.

Interlec, US manufacturer of the SuperBrain micro — which it claims to be the best selling CP/M



STREET... Sharp running third in its Japanese home market.

micro in the UK — has also cut the prices by between 19% and 29%. End users should now be able to get machines, with inbuilt floppy drives, from around £1,500, says Interlec's UK representative Robin Harrison.

Harrison, who is establishing an organisation here to support local SuperBrain dealers — and to gain wider recognition for Interlec as a company — also promises systems with inbuilt Winchester discs for later in the year.

# 'Demand for semis growing'

DESPITE gloomy first-quarter results, Texas Instruments is predicting a 10% increase to \$14.5 billion in the world semiconductor market in 1982.

According to TI president Fred Bucy, "In the US, demand increased in the first quarter over the fourth quarter of 1981, and this increased demand is continuing in April. Although many uncertainties remain for the near term, we believe the world semiconductor market will grow at an average rate of 20% per year to reach \$45 billion by the late 1980s."

A sharp fall in profits from semiconductors was the major feature in the company's 19% drop in income for the first quarter of the year. Net income was \$27.7 million on sales up 1.5% over the same quarter in 1981 at \$1,078 million.

Bucy reckons that Texas' net semiconductor sales declined more than the total market's one per cent drop in dollar value worldwide.

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## Ferranti takeover battle soon

THE covenant which prevents the sale of half of Ferranti's shares by the first purchasers at the government sale expires in August, and the City is beginning to show some interest in the expected takeover battle.

Neil Barton, an industry analyst at Manchester stockbrokers Henry Cook Lumden and Co, suggests that neither potential Monopolies Commission referrals nor management constraints will prevent all companies bidding.

He identifies Hawker Siddeley and STC, the ITT part-owned subsidiary, as the most likely contenders, with GEC and Plessey

ruled out because of possible objections from the Monopolies Commission.

Ferranti pushed its turnover in 1981 to £271 million, from £244 million the previous year, with profits showing a similar upturn from £15 million to £20 million.

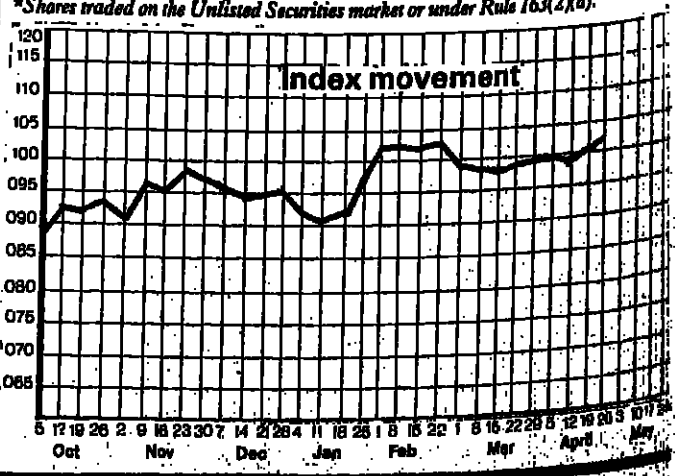
Barton opts for an independent future for Ferranti as the best of the possible outcomes.

He suggests that growth in the future will be even stronger than the past, with shareholders receiving greater benefits from holding Ferranti shares than from accepting a bid in either of the companies' shares, or cash.

## CW SHARES TABLE

Price	London Stock Exchange	Price	C	Price	US Stock
High	Low	High	Low	High	Low
180	181	180	181	180	181
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The table shows the closing prices of The London Stock Exchange on Tuesday and Wednesday on Monday of last week. The Share Index is based on the prices of the companies in the table. Highs and Lows have been adjusted where necessary.



## Motorola extends 6805 microcomputer range

FOLLOWING its flurry of activity around the 6800 family, Motorola has come up with a batch of offerings in its 6805 single chip microcomputer range. These include new chips and evaluation and system design aids.

Two new microcomputer units increase the variety of on-chip memory and I/O that surround the basic CPU. The MC6805P4 gives 112 bytes of standby RAM, 1,100 bytes of ROM, 20 TTL or CMOS compatible lines, eight of which will drive LEDs, and a clock generator. It also includes zero crossing detection and a self-check mode. Customer software patterns to be mask-programmed into the ROM are now being accepted by Motorola.

For users wanting EPROM on chip rather than ROM comes the MC6805U3, a chip with 3,776 bytes of EPROM. It emulates the

6805U2 ROM version. It also has 112 bytes of RAM, timer, I/O lines (24 this time) and clock generator on the chip.

A further EPROM 6805 version features in a design/evaluation kit aimed at engineers — basically mechanical engineers with little electronics experience. Called Design Five, it sells for around £50 and offers the basic hardware and software building blocks Motorola deems necessary to develop prototype systems.

The kit includes the MC6805P3L microcomputer, with its 112 bytes RAM and 1.8 Kbytes EPROM and I/O and timer, with surrounding chips like A/D and D/A converters, back-up RAM and display drives.

Macro assemblers for the 6805 family feature among a clutch of software packages for Motorola's Exormac development system.

## Apple axes US retailer

LEADING US microcomputer manufacturer Apple is to end a central purchasing agreement with its largest retail account, ComputerLand. The move is seen as trying to improve relationships between Apple and its own network of 2,500 authorised dealers in the US.

The agreement with ComputerLand, itself a franchiser of small computer products, meant that the ComputerLand dealers had a price advantage over the competing Apple dealers.

This advantage is to be removed when the current agreement expires in July.



5477  
tens  
voice





SMITH: "... the antidote to nasty events that are not certain to happen."

## No foolproof security procedure

by Andrew Thomas

"SECURITY is the antidote to nasty events that are not certain to happen. The combination of nastiness and uncertainty, coupled with the fact that most DP Managers are perpetually behind schedule, means that when it comes to priorities security gets short shrift."

So said Alan Smith, a speaker at Compacts '82, sixth of the annual forums on computer audit, control and security organised by the Institute of Internal Auditors. Smith is Head of Management Services at Tootal and is also on the board of the NCC, where his special interest is all aspects of computer security.

He believes that computers are a means to an end, and that the emphasis in contingency planning should be placed on the systems, of which the computer is but a component, rather than on the physical integrity of the hardware, as is often the case.

"The first line of defence, and the line which gets the most attention, is concerned with those actions that either stop or reduce the chance of a peril striking at one of the component parts of the system," he says.

But he claims that this first line is deficient in at least three major areas. Firstly, no defence is foolproof and many precautions contain a fallible human ingredient. Secondly, most precautionary measures involve compromise to some degree. For example, some access prevention systems involve cumbersome card keys or numeric keypads which are so inconvenient in practice that the doors the system is designed to protect are frequently wedged open so staff can get on with their jobs without being hindered.

But the most critical shortcoming of first line defence is that, no matter how competent the person

designing the security procedures, some means of defeating the system will remain.

For these reasons, a second line of defence is required for a procedure to follow should something untoward occur. Some problems are best left to the second line defence rather than attempt impossible expensive preventive measures.

While sophisticated uninterrupted power supplies can provide unbroken service in the event of a power cut, their cost and bulk often cannot be justified in a commercial environment.

Simpler, cheaper standby generators are usually adequate for most sites. That is, don't bother trying to prevent power failures; simply plan for alternative arrangements should one occur. Similarly, while it would be desirable to be 100% certain that your systems are error-free, the manpower and time re-

quired to achieve this would be extremely expensive. Better to have skilled staff able to handle any failure that they occur.

But, says Smith, there always be some risks which will prove so traumatic that they come to fruition that the effort should be expended in the first line, preventive measures.

Fires, floods and cyclones damage all come into this category. The severe upheaval of interruptions caused by such events makes their prevention paramount.

It is far easier to structure defences than to design contingency plans for the smallest of contingencies. The latter is a task which companies provide a package ready to be installed. No real effort involved; just capital expenditure.

Disaster waits for no man — so contingency planning, although often time-consuming, should be a priority

WHEN it comes to contingency planning, there are no simple solutions, no quick and easy answers. Someone must work out exactly how critical the various systems are to the company.

There is no point in asking individual departments to do this — each area within the company will be equally sure that the systems run for them are of prime importance, and that the company will fold should their listings be half an hour late arriving on their desks.

The time-consuming, boring legwork required for someone to discover which systems are truly company critical can be off-putting, resulting in the standby plan being left until the person responsible "has time to do it". Unfortunately, a disaster waits for no man. It is no consolation to be told that the standby plan will be ready next

## If your site collapsed, would there be business as usual?

he would take a fourth copy of the most important files home with him and keep them in his kitchen over the weekend.

It is hard to imagine that anything short of a global nuclear holocaust could interfere with such a belt, braces, piece of string, and superglue approach, but it is generally accepted that however detailed the contingency plan, something will have been forgotten.

Once you have checked these points, you should be in a position to say with some degree of confidence if the system is recoverable in the event of a total loss of the computer and the building (what we termed the "747 falling on the building" syndrome).

Once all the company-critical systems fall into the "recoverable"

category, put your money where your mouth is and test your contingency plans — you will have forgotten something, and it is better to discover the omission before the 747 hits.

Alan Smith divides contingency planning into two disparate functions — fallback and recovery. "Recovery is concerned with those actions that restore the user to normal operation," he says. "Recovery takes time — it may be a matter of seconds or it may be a matter of months. Fallback is concerned with those actions which take place during this time interval."

He divides the period following an interruption to a system into three time frames. Time frame one involves the user waiting for normal service to be resumed; time

frame two requires significant actions to be taken, while still assuming a reasonably prompt return to normal running; and time frame three covers periods which can no longer be deemed temporary — the 747 has landed on the roof.

The actual duration of these three periods will vary with the application involved. The computer disappearing out from under you, five minutes before payroll is due to run, will place a high degree of urgency on the system, thus shortening time frame one.

But for some systems, this first phase may last for several days before the survival of the company is called into question. One advantage of drawing up a contingency plan is that you may discover that that old system, which has been

running for years, is not actually required by anyone — it has happened!

When some form of fallback becomes necessary, the system enters time frame two. The procedures used may range from a reversion to a manual system to the use of a duplicate hardware configuration at another site.

The usual arrangement for such standby is a reciprocal agreement with another organisation with similar hardware. One of the scheme's major drawbacks is the almost impossible task of maintaining the two installations in an identical state of modification, both hardware and systems software.

Machines which are in theory identical are often different in

ways so obvious that they will be discovered when the machine workload falls in a lull.

Another problem with a standby arrangement is the overlooked question of the surviving machine of the workload in addition to the demised sibling. Could you run with double the workload?

When the time required to return to normal working is long, that the degraded workload can no longer be tolerated, time frame three is entered. It will usually mean that the workload is completely destroyed.

Despite the general cynicism regarding the level of help provided by their hardware vendors, manufacturers are surprisingly fast to respond to a call for help from one of their customers. They will usually be able to

Manufacturers are surprisingly fast to respond to a plea for help from one of their customers.

vide machine resources at their own sites, or even to replace replacement hardware in a matter of days.

When Dennis Ferranti's ICL 2903 was destroyed by fire in 1980, ICL provided facilities at Manchester customer centre as the most critical systems came on-line. Another 2903 was delivered to another site, the work was continued until the replacement computer was complete — more than a year later.

Assuming that programs and data are secure, along with relevant documentation, the provision of replacement hardware to enable the company to carry on almost as if nothing had happened — providing there is a remote location for the installation.

There are concerns which provide complete environments — conditioning, false floors, power supplies and communications lines, either on their own premises, or in Portofino where can be delivered to the customer's own site.

It is also possible to put up an "environment" — known as a "cold" standby centre — for your own company's use, but the expense of such a contingency usually precludes this in all but the largest firms. A more common alternative is for several firms to share a single cold centre.

In conclusion, safety systems designers must be encouraged to incorporate fallback and recovery procedures in the original system. Let's face it, the original systems are likely to be systems which are going to be increasingly difficult to maintain.

## PROGRAMMERS PAGE

BIS Software proves that specialisation can be made to pay dividends

## Golden eggs put all in one basket — the Midas touch

WHEN a company puts all its eggs in one basket and then wins Queen's Industry Awards for Export Achievement, two years running, I conclude that the basket must be strong. Or perhaps the eggs are unbreakable.

I refer to BIS Software of London, which owes much of its success to its Midas banking package. Kathy Haskins, BIS Software's programming team and has overseen the design of Midas since 1977.

For her I have a few questions tripping off my tongue. Like why do so many banks buy Midas? Because it hit the market just as banking was becoming more international, when for example currencies were floated for the first time. "One German bank lost £10 million on foreign exchange about this time," says Haskins.

Midas catered for floating currencies, incorporating programs to control profit and loss from switching between them.

Flexibility is another key to the success of Midas, according to Haskins. Banks do not conform to any standard in their use of figures

— even the calculation of interest rates differs between them. Therefore ease of maintenance is paramount in a general purpose banking package, and this is achieved in Midas by having the programs table-driven. To run Midas for a different bank, just slot in a new table of figures.

Security can be threatened if one person attempts a drawdown followed nanoseconds later by another on the same account. Suppose there is enough money in the account for either one or other of the withdrawals but not enough for both. It is then possible for both transactions to be given the go-ahead at the checking stage. If both are completed, the account will be overdrawn unless some other action is taken.

One solution is to keep the record locked until the transaction is completed, but this will slow up the processing. BIS found a better solution for Midas: a log is kept of record accesses. Then if it turns out at the transaction stage that money has been withdrawn since the initial check was done, the transaction can be rejected.

The spectre of security breakdown drives the whole Midas

system. For example in banking there is a transaction called an option deal which involves withdrawing money in a process called a drawdown. To achieve this, the system checks that sufficient funds are available and then performs the withdrawal.

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Any embarrassing bugs

unearthed in the system after an installation?

No disastrous errors, is the response. "But we do unearth bugs when we take Midas into another country," Haskins adds.

Such as Japan. The problem there is that some types of yen loans accrue interest on the first and last day of the period rather than just on one or the other as in the industrial Occident. This nearly caught BIS Software asleep. But not quite, clearly.

Other little niggles arise from time to time, like different ways of collecting fees.

Another problem that cropped up in the UK is that while interest rates are high, the profit margins of banks are squeezed by their having to compete extra hard to lend money. Therefore they lend at money market rates, which is close to the minimum lending rate. In fatter times, they lend at two points over base. "We have to be continually on the ball for new ways of getting these fees into the system," says BIS Software development director Malcolm Wright.

The last of my catalogue of snakes was stepped over by Midas last October when all the New York clearing banks changed their systems. BIS had anticipated this and inserted a data flag into the system to effect the necessary changes without a hiccup, when the time came.

It just remains to indicate where Midas is going next. One possible new application for Midas lies in the new London market of financial futures.

Financial futures are the City's equivalent of laying off bets to the bookmaker. They are options on

HASKINS: "... unearths bugs when Midas is taken into a new country."

future commodities, such as cocoa, that are not yet available and do not yet have to be paid for in full. At the same time they are likely to change in value at a similar rate to something in the real live market, so enable stock market punters to hedge their investments. They also give punters a smoke signal of where the market might be going. For example, if cocoa was trad-

ing high on the futures market, someone with a warehouse full might be tempted to wait before selling.

Clearly a system which deals with the futures market requires careful thought and BIS Software is not willing to invest in one unless it is sure the banks will buy it. At present it is soliciting banking opinion on the matter.

## Speeding along the Ada rush . . .

PROGRAMMERS everywhere are itching to get their hands on Ada. At least so believes the US company Softech, which has therefore launched an Ada-Pascal translator previously used for developing Ada compilers.

According to Softech consultant Peter Yeomans, many companies want to get off the mark as soon as reliable Ada compilers are available, and meanwhile want to learn and practise the language. At pre-

sent there are many Ada compilers under development, at York University for example, but few are ready.

The translator, which costs \$4,000, can be used to write in Ada any constructions possible in Pascal. But since Ada is a larger language than Pascal, there are limitations. Softech has however

produced a specification of these.

Meanwhile changes are still taking place in the language definition of Ada, so the final version is yet some way off. Until then, funds for Ada developments in the UK are likely to be limited as companies are naturally reluctant to invest in compilers based on liquid premises.

... or just telling us it's coming

If the contents of my massive postbag are indicative of the state of mind of the programming community, it is a wonder any decent software gets written.

Perhaps the programmers who write to me take the opportunity of letting their intellectual trousers down after a day of mental torture on the coding bench. At least I hope that is the reason.

Programmers in the US now have an outlet for their zanier thoughts in a forum for the free exchange of technical ideas called the Open Channel.

Members of the US Computer Society are invited to submit a page of ideas on any computer-related topic so long as the laws of libel or the protocol of decency are not breached.

I have one such page before me which is full of glorious nonsense about the Ada language. It begins with the acute observation: Ada is coming. It ends by qualifying this: Ada is coming anyway. Ada is coming anyway.

### PUZZLER

A/B + C + D = 288  
B/A + C + D = 228  
(A + D)/(B + C) = 448

All four integers used here are positive, and different. Can you identify them before turning to page 47?

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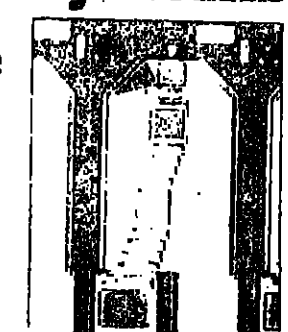
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week if your premises have been reduced to a smoking ruin.

The introduction of gleaming new devices to prevent fires and unauthorised access is far more interesting and glamorous than plodding through long lists of computer systems and attempting to put some kind of relative priority on them.

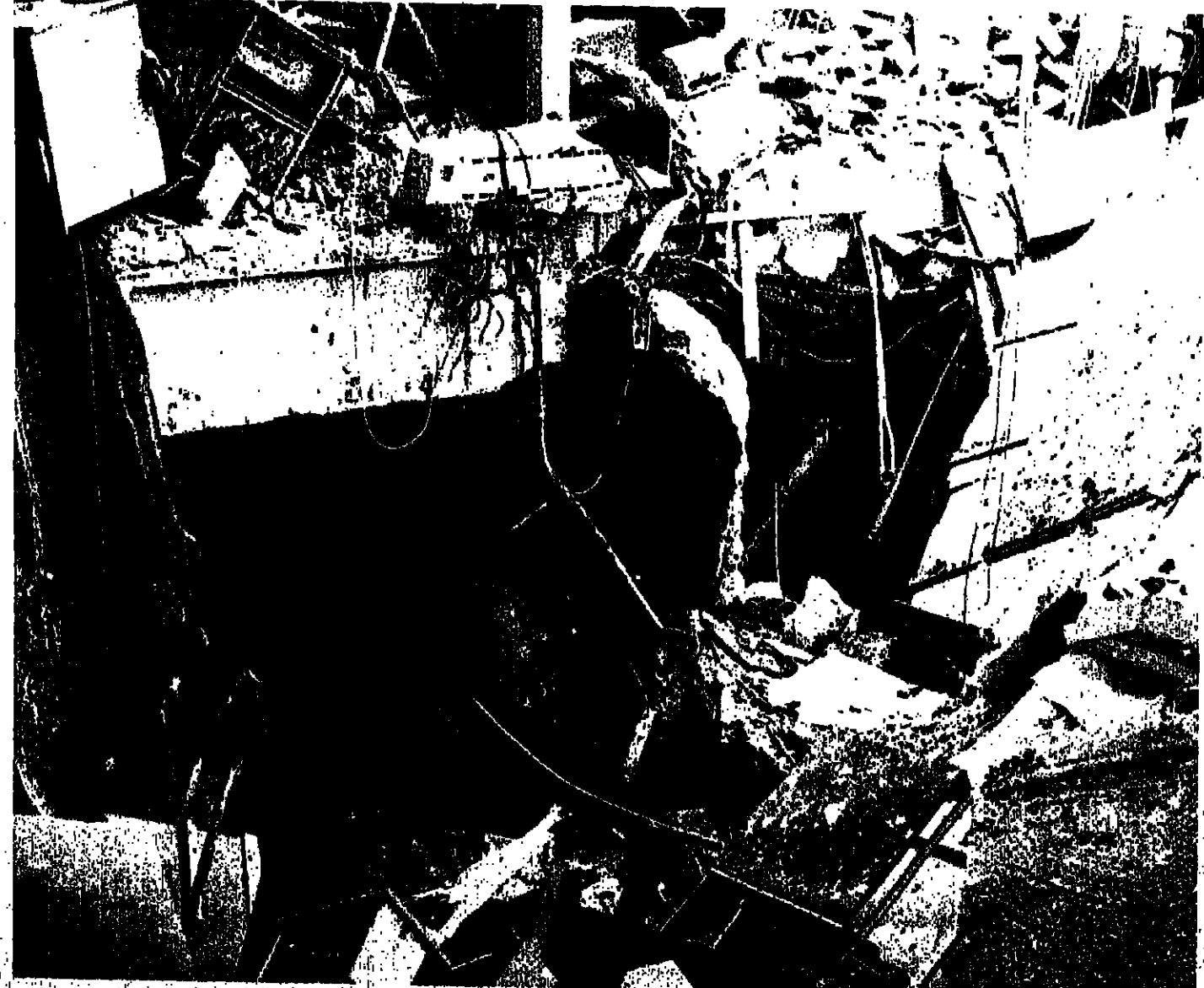
Because of this many organisations believe they have done all that is needed to secure their continued existence once they have installed the latest micro controlled gadgets available.

It is vital that the driving force for the contingency plan is at least board level. Otherwise, the plan will be at risk from both the parochial attitudes of individual managers and a lack of enthusiasm on the part of the person assigned the task.

Once the company-critical systems have been identified, the following criteria should be judged. Is the system documentation adequate to permit someone who does not know the system at all to run it successfully? One should not assume that Fred who wrote it 10 years ago will still be around and able to resurrect it.

Is there a copy of the documentation held in an off-site location? Even the best documentation burns. Are there up-to-date copies of programs, JCL, and data? Are they stored in a secure location — either a fire safe on-site or in a different building?

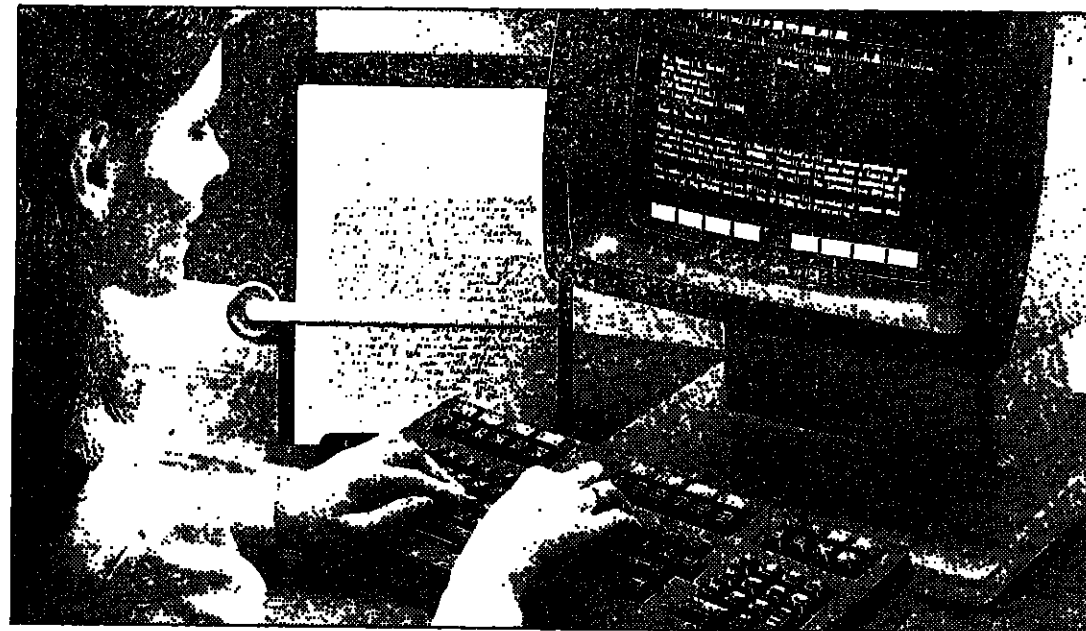
One manager of my acquaintance was unsure that the copies of critical files in the tape library, the second copies in the fire safe, and the additional tapes held at another office of the company were sufficient. Each week,



Even the best documentation disappears in this sort of mess.



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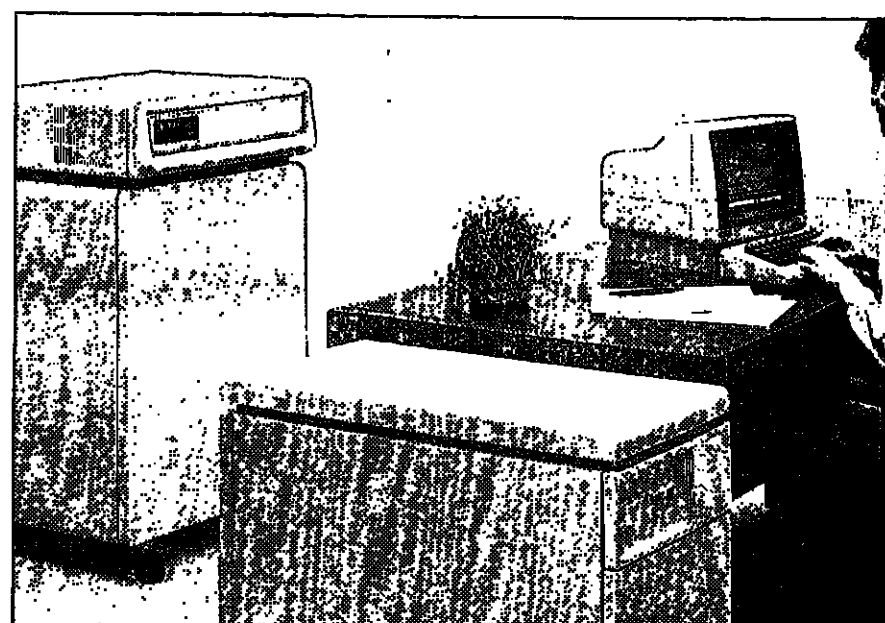
This manager's workstation gives business professionals easy access to the information they need for decision-making, without demanding an understanding of computers.



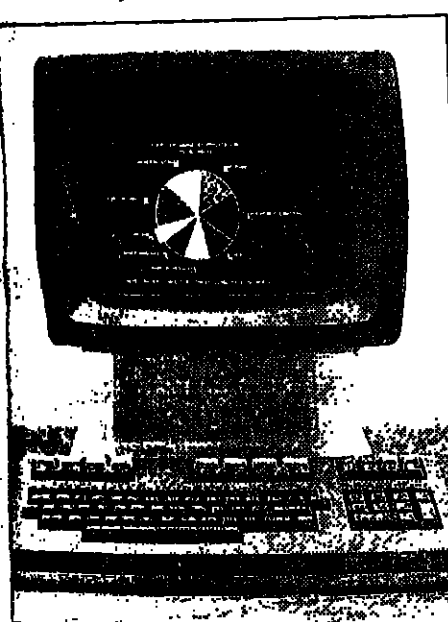
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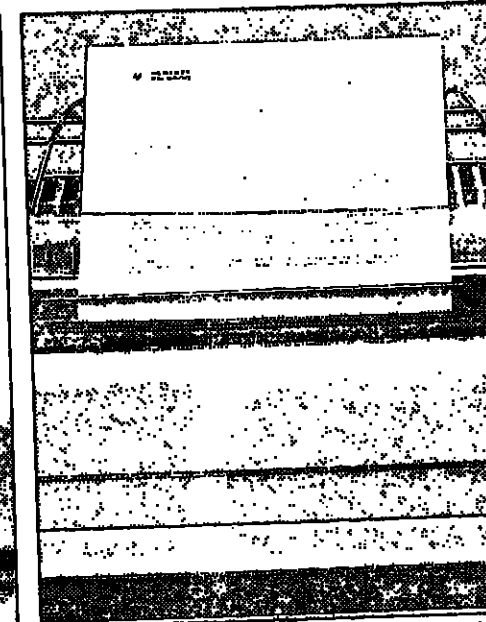
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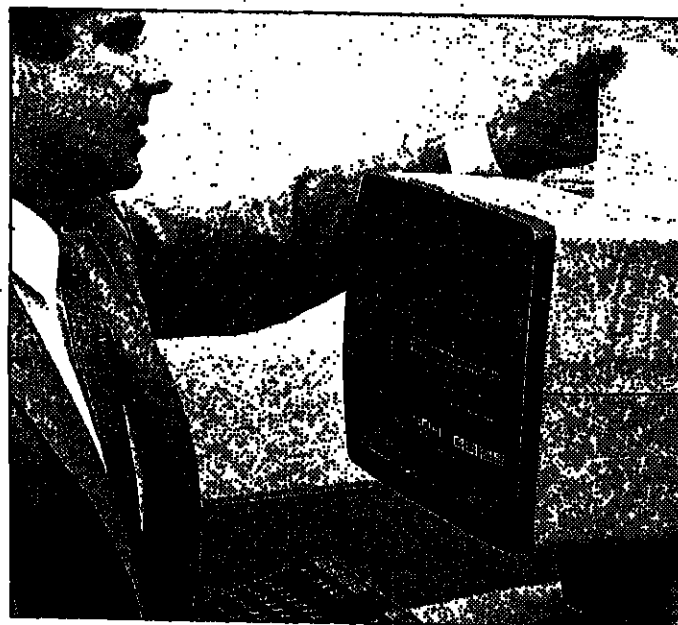
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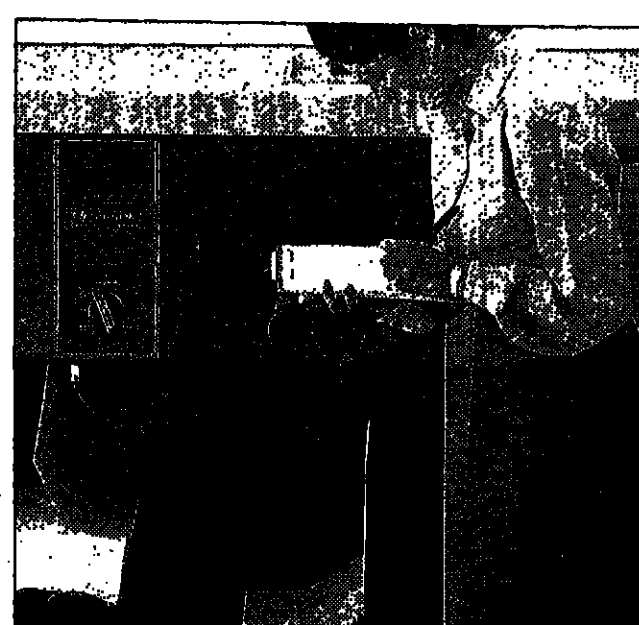
Graphics created on this low-cost terminal can be plotted on paper or transparencies.



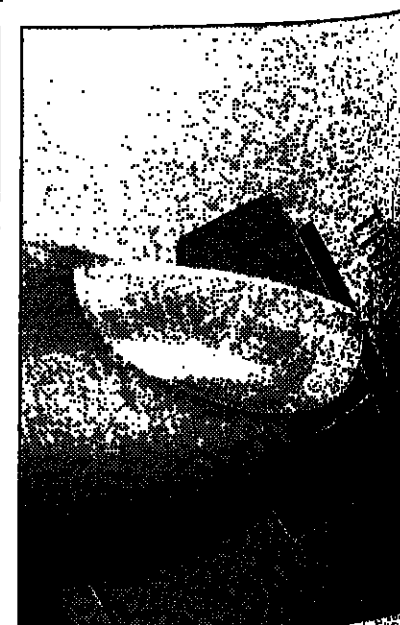
High-quality printing for business correspondence and reports can be generated on this letter-quality printer.



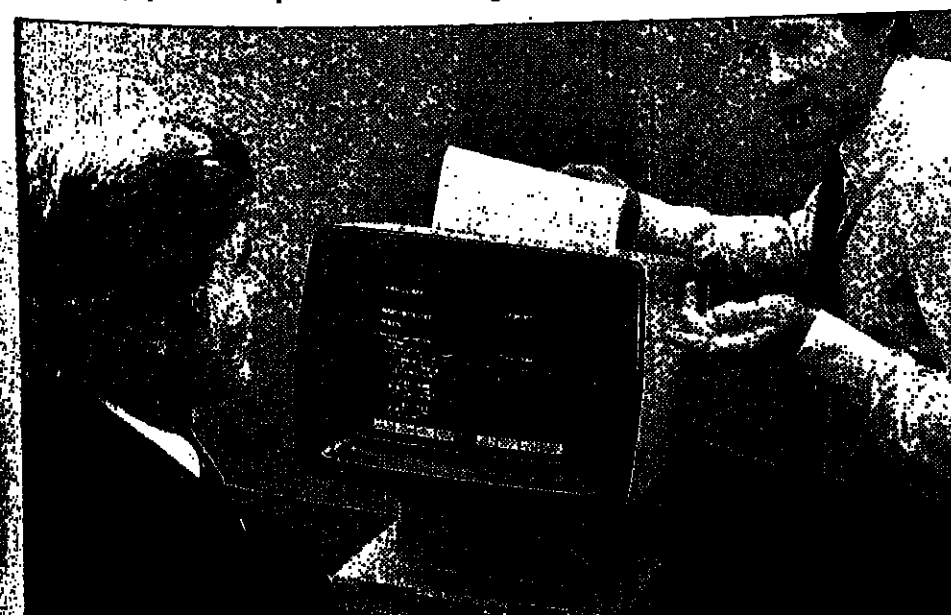
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## Scan restructures board of directors

SCAN Data International and its main subsidiary Scan Computers has completed a reshuffle of senior staff. With Martin Baldwin moving up from managing director of Scan Computers to become deputy chairman of Scan Data International and chairman of all the subsidiaries.

Replacing Baldwin at Scan Data is Steve Russell, formerly MD of Scan Computers. He also becomes managing director of the group and Scan Computer Supplies.

Noel Atkins, sales director of Scan Computers has been made a full board director of Scan Data International. This appointment

was made to add marketing strength to the group board in readiness for future growth, says Baldwin.

Former subsidiary administrator Geoff Bridgman has been promoted to administration director of the boards of Scan Computers and Scan Computer Supplies. Promotion also for customer support manager Barrie Coren, who becomes software director of Scan Computers.

Mike Davey has been brought in from Data 100 to become sales manager of Scan's Bristol office, which recently achieved its biggest order to date for 11 Texas DS990s from Dalgey Spillers.

## NCR supports local community projects

THREE British Junior Chambers will each receive a £1,000 boost for community projects from computer manufacturer NCR, as winners of the company's British Junior Chamber competition. Entries came in from the UK's 40 Chambers, suggesting projects that would benefit their local communities.

According to NCR many projects aimed to fill gaps left by government spending cutbacks.

Northampton JC will spend its money aiming to make the public aware that most liquid medicines are damaging to the teeth. They will campaign through the local media, posters, leaflets and stick-

ers and the project has the backing of local dental, pharmaceutical and medical authorities.

Lichfield JC will provide video camera and ancillary equipment plus a management consultancy service to local secondary schools to record mock job interviews.

Students will also be given advice in letter writing, form filling and interview behaviour to better equip them for the increasingly competitive business of getting a job.

Ipswich JC is to survey 5,000 youngsters in its area on unemployment, leisure, authority and employment. The results will be computer analysed and measured against local authority plans.



Texas Instruments has jointly set up what is thought to be the first apprenticeship scheme for computer service engineers, with Bedford College of Education. The company has so far spent £50,000 on development systems for the college. Twelve apprenticeships are being funded each year for a three-year course, which includes instruction at

TI's manufacturing plant in the Netherlands, the service and repair centre in Plymouth and further product training in Nice or Austin, Texas. A fourth year will be administered by TI to give other skills necessary to become representative of the company. Staff and students are shown above working with Texas Instruments equipment.

■ Richard Davies, former director of Information Services and Equipment has joined DM England as viewdata product manager.

■ David Parsonage has been appointed product marketing manager at Rediffusion Computers in Crawley. He joined the company in 1977 and was latterly branch manager of the Northern region.

■ Peter Tobias and Steve Rubin have been appointed managers at Osborne Computer Corp. Tobias, who is technical services manager, previously headed product support groups with ICL, CTL, and Delta Data Systems. Rubin, Osborne's marketing manager, was formerly with software supplier Intelligence (UK).

■ Mike Blench has been elected to the board of CPU Computers, LSI's parent company. Blench is the executive in charge of LSI's computer systems and software development.

■ David Brown has joined Systems Resources as software product sales manager. He was formerly area sales manager at BOC Datastore.

■ John Barnes has been named territory sales manager, national sales division, at Geest Computer Services. He was previously with AM Jaquard systems.

■ John Ing has been promoted to manager of international operations of Perlec International's peripheral division. He joined the company in 1980 and since last July has been district sales manager, North Europe.

■ David Bone has been appointed production manager at Office Technology, OTL. He joins the company from Dicol Electronics, where he was production manager.

■ Grant McEwan has been appointed marketing services manager at Transdata. He was formerly an account executive at PR consultancy Blair Bowden Associates.

■ Jeff Nott has been appointed sales executive at Compact Accounting Services. He will sell applications software for accounting and invoicing and the company's Compacatprint costing and estimating system.

## Consultancy

A NEW computer consultancy has been formed by City of London chartered accountants Hacker Young and computer services organisation the Fraser Williams Group. The company will operate under the unsurprising name Hacker Young Fraser Williams from Fraser Williams' offices in this country and in the US and Canada. Executive directors are Arthur Harver, a partner in Hacker Young, and Ian Gold a director of Fraser Williams (London).

## Manager for new NEC dept

THE applications department of NEC Electronics (UK) formally wards the end of last year, says manager. He is Bob Laird, formerly a project leader with the conical Space and Defence in Scotland.

Laird's career in applications began in 1967 when he joined the National Engineering Laboratory at East Kilbride as scientific assistant. He stayed until 1971, becoming higher scientific officer.

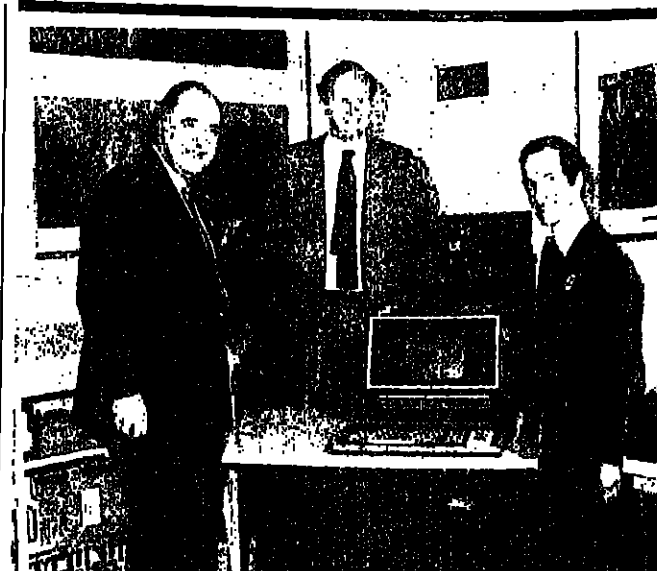
He then joined Burroughs as systems designer, going on to become senior systems engineer in 1977, following the achievement of an MSc in digital systems theory, part-time study at Strathclyde University, he was promoted to section head. In this post he was responsible for the design of peripheral control systems and computer architecture.

He joined Marconi in 1979 where as project leader he was involved with simulation and automatic test equipment.

## Transfer

FORMER senior director of Computer Resources Tony Richards has become marketing director of United Computing's UK operation. The company recently acquired the business interest of professional services and software products divisions formerly operated by Computer Resources Group.

The two divisions will be a sister company to United Computing's bureau services.



When Walsden Computer Services replaced its seven-year-old ICL 2902 with an IBM System 34, it decided to give away the old machine to chairman Bill Becker's (left) old school. The boys of Shrewsbury School installed the computer themselves, which was donated complete with disc drives, screens and 80 lpm printer. David Beaton (centre), managing director of Walsden, presents the machine to the school's computer department head, Gilbert Rowe.

## DIARY

MAY 12 Ambiguities in machine translation by Peter Wheeler of the EEC. BCS Natural Language Translation Specialist Group. King's College, Strand, London. 6.00.

MAY 17 Recent developments in cryptography by Dr Donald Davies of the National Physical Laboratory. BCS Technology of Software Protection Group. BCS Headquarters, Mansfield Street, London. 6.30. Details Simon Elsom (021) 3599 3661 ext 735.

MAY 19 Ron Adam from British Telecom on the first year's experience running SwitchStream: 1 packet switched service. BCS Data Comms Specialist Group. BCS Headquarters, Mansfield Street, London. 6.30. Details Peter Radford on 01-636 5440 ext 205.

MAY 20 AGM and computer archive films. BCS Coventry branch. Physics Lecture Theatre, University of Warwick, Gibbet Hill Road, Coventry. 7.30.

MAY 21 Teaching programming languages for microprocessors. IEE, Savoy Place, London. Details from IEE on 01-404 1471, 2.00.

IBM could have designed its own personal computer . . . Martin Banks wonders whether the company plans to do so

## It's time to ask IBM a personal question or two

NOW that IBM has elevated the personal computer business into the "real" world of computing by opting to produce such a personal machine itself, a question remains begged and as yet unanswered: why did it not produce a machine which could run IBM software?

IBM has such a vast stock of software all around the world that it seems strange that it did not attempt to capitalise on that base in some way. For some reason, IBM chose the Intel processor and therefore the software that automatically followed such a choice.

The next question, and possibly the more interesting one, is whether the current choice precludes any alternative developments in the foreseeable future. In other words, could IBM actually go ahead and produce a desk-top 360/370 type machine and make it work, and would it be worth its while to try?

The choices behind the design and configuration of the IBM Personal Computer have been restricted by both the company's and the industry's history.

IBM had never dabbled in the world of high-volume, low-value computer systems manufacturing, especially where the means of distribution is in such an alien

processor (set) would be manufactured using as its basis a family of array components that are proven in both component and system manufacture.

In terms of hardware, IBM could do it. There is, however, one slight proviso on the subject of hardware, and that is prompted by the practicalities of software and, more specifically, operating systems. Not unnaturally, there is a strong big-systems bias in this particular area, and that means big hardware systems have to be considered to complement it.

Now, there have been great strides made in the technology of memory components and systems, but the requirements of some IBM operating systems - MVS for example - make them seem insignificant. Such operating systems require megabytes of memory just for themselves, on top of which must then come allocations for the applications program and user work space.

There are, of course, ways round this problem, in theory at least. One of those is networking, and this is an area where IBM has a strong presence. Unfortunately, this presence is in the big systems arena with Systems Network Architecture (SNA), which has been around for several years now. In addition, the company has the 5280 system, which to some extent looks like a forerunner of the 360/370 type of desk-top system.

SNA, however, is an architecture that is not only designed on a grand scale, it operates on one as well. It is not suitable for use in the local networking context of a collection of linked desk-top computers. IBM does not have an announced product in the area of Local Area Networks, and in accordance with its normal policy, declines to speculate on what might come in the future.

Though some announcement is certain to come from the company in this area at some time, it is likely that it will have little application to the idea of linked 360/370-type machines running some form of dispersed large system architecture or operating system.

Though it is possible, therefore, for IBM to produce the hardware for a desk-top 360/370 type of machine - up to a point - there seems little long-term validity in the suggestion that it should.

It is one thing to produce the hardware that can run the requisite instruction set, which means that the software can also be run. It is another thing to attempt to realise in hardware the necessarily complex architecture of those big systems.

It could be done, and it could be done in a more compact form than in the originals, but such machines would hardly be the desk-top units that would make such a product attractive, and they would almost certainly still be very expensive.

As one IBM official defined it: "It would be like trying to run a long distance bus service with a fleet of Minis; possible, but hardly sensible."

There is, however, one final aspect to all this, and that is the applications software that already exists, and will exist in the future. Though much of it is oriented to the big systems concept - for example banking or BFT systems - there is much that has been produced by DP departments for smaller applications. There are many stand-alone programs that could find a market outside the originating company.

Then again, there are the packaged products. IBM, far from

wanting to keep the software market all to itself, is now actively encouraging third-party software producers to get in on the act and produce packages for its hardware products.

As technology both increases the capabilities and reduces the size of systems hardware, there remains the idea that, though not really feasible for now, some form of small, lowish-cost machine might well appear from the Blue Giant in the future.

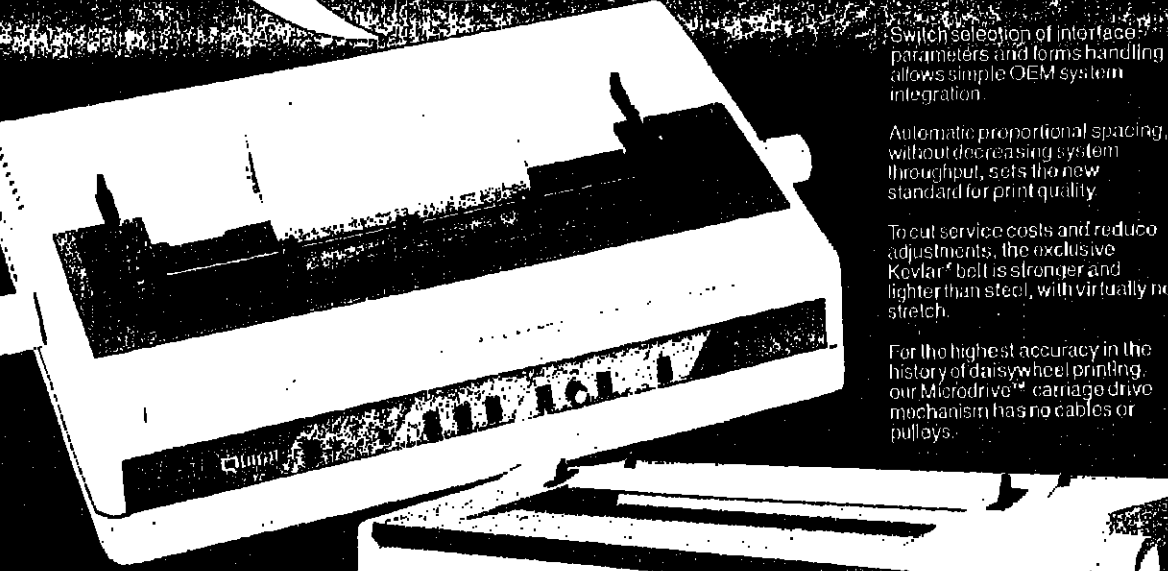
After all, virtually every pundit in the business observes the fact that software - its availability and its quality - is the biggest single restriction on the growth and development of the "personal" computer business. It would seem wasteful to let what already exists go unexploited.

INDEX of the rate of technological change: IBM has tained the arithmetic logic unit of a 360 mainframe already demonstrated an experimental circuit which con-

(above) on a single chip.

(above) on a single chip.

# QUME



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SCHAFF . . . Micro future will be either Paradise or Hell.



It is possible to train the unqualified and disadvised in saleable skills for the industry.

## Conjuring up lurid visions of the microelectronic society

SINCE pre-history the human race has spent a great deal of time and effort trying to predict the future. The stars have been surveyed, palms read, the insides of dead animals probed, and tea leaves pondered, all with results that have not impressed the more rational among us.

More recently, specifically over the last five years or so, a great deal of effort has been put into trying to divine how the world is going to be changed by the wonders of microelectronics. Sadly, all this work has achieved little more than the labours of all the augurs from Delphi to the makers of horoscope calculators.

Lurid pictures are painted of possible futures resulting from the new technology, all extremes in one way or the other. One set of voices tells us we could have a future of leisure and self-fulfilment. Another set tells us that we will all live in grinding poverty, except for a few clever people who will be immensely rich but presumably working too hard to enjoy it.

Both of these visions are very different from the world as it is at present. How, in detail, could they actually come about? Exactly what steps would history have to follow for these things to happen?

We are not told. Indeed, careful thought about the matter leads us to wonder whether there is in reality any way in which these futures could come to pass.

The latest prestigious body to indulge in electronic crystal-ball-gazing is the Club of Rome. At its meeting last month Adam Schaff, the Polish Marxist philosopher, asserted that the future with microelectronics would be either Paradise or Hell, but he declined to say what this Paradise or this Hell would actually consist of. Could this be because these notions do not bear close examination?

We in the West tend to regard Japan as a country where they do not fret about the microelectronic future, but instead just go ahead and build it, much to the detriment of our own economies. However, there is some soothing going on there too, most notably by the academic and system designer Yoneji Masuda in his book *The Information Society as Post-Industrial Society*.

He too describes two possible futures, one in which every individual will have the opportunity of "self-realisation" and in which "synergy" will abound like some updated secular version of the Holy Spirit.

Masuda's other future he calls *The Managed Society*, in which "ruling elites would guide the managed (persons and things),

using information networks, as control mechanisms."

But how would they do this? He does not say, nor does he show how self-realisation would become so much more attainable in his Paradise.

If one examines what difficulties people have with finding fulfilment at present, one sees that lack of time is only a minor part of it, and increased ability to handle information would hardly dent the problem.

One often-quoted worry about the future is that those who understand the new technology will grow enormously rich, while everyone else will slide into poverty. This view was reiterated last

month in the anti-IT Year film produced by Education Media. TGWU convenor Pat McDougall remarked: "We're going to end up with an awful lot of time on our hands and no money."

This overlooks a fundamental characteristic of microelectronics technology - its modularity - which makes it quite impracticable for anyone to acquire a monopoly of knowledge about it.

Far more than in other industries, no-one in computing understands it all. Each person understands his own little corner of the business, and is totally dependent on the support of others to keep going, whether the others are hardware maintenance techni-

cians, system software people, applications programmers, telecommunications specialists, or whatever.

In addition, the "module" which one person knows can be fairly small, so it is possible for instance to provide unqualified, disadvantaged youths with saleable skills in the business. If a technical expert is getting paid over the odds for his services, there is nothing to stop other people from acquiring his skill and undercutting him. And changes in the technology are making this easier all the time.

The other dubious aspect of this vision of doom is purely economic. There is no way in which there could be only a few rich people

producing things, leaving everyone else with no money, because then there would be no-one to buy the goods from the rich and sustain their wealth.

Even if industrialists were capable of forcing the mass of the population out of the economic system, such an exercise would be self-defeating, as illustrated by the reported interchange between the boss of General Motors and the head of the car workers' union at the opening of an assembly line manned entirely by robots.

Smugly the company president asked, "How will you organise these?" Replied the union man, "How will you sell them motor cars?"

One example of a Hell that does bear examination is the establishment of tyrannical government, using new technology to help its repression. This danger has been cited by no less a figure than the late premier Konstantin Gerasimov.

It is not, however, a technical issue: it is a political one. Tyrannies have always managed the past without technology and we can only guard against its recurrence with our existing processes of democracy.

Throughout the discussion so far, choices to do with the new technology. But is it? There is no choice in whether we adopt new things less efficiently than otherwise for some ostensible human benefit. Humanity as a whole cannot benefit from new things unless some particular group may. Change can be painful but we have no alternative than to face it.

Similarly, those calling for "human-centred" systems design in which ostensibly the man drives the machine rather than vice versa ignore the fundamental point which is that the proof of the pudding is in the eating.

Which system design best fulfils the objectives (assuming that the objectives have been adequately drawn)? Only one will, so there is no real choice either.

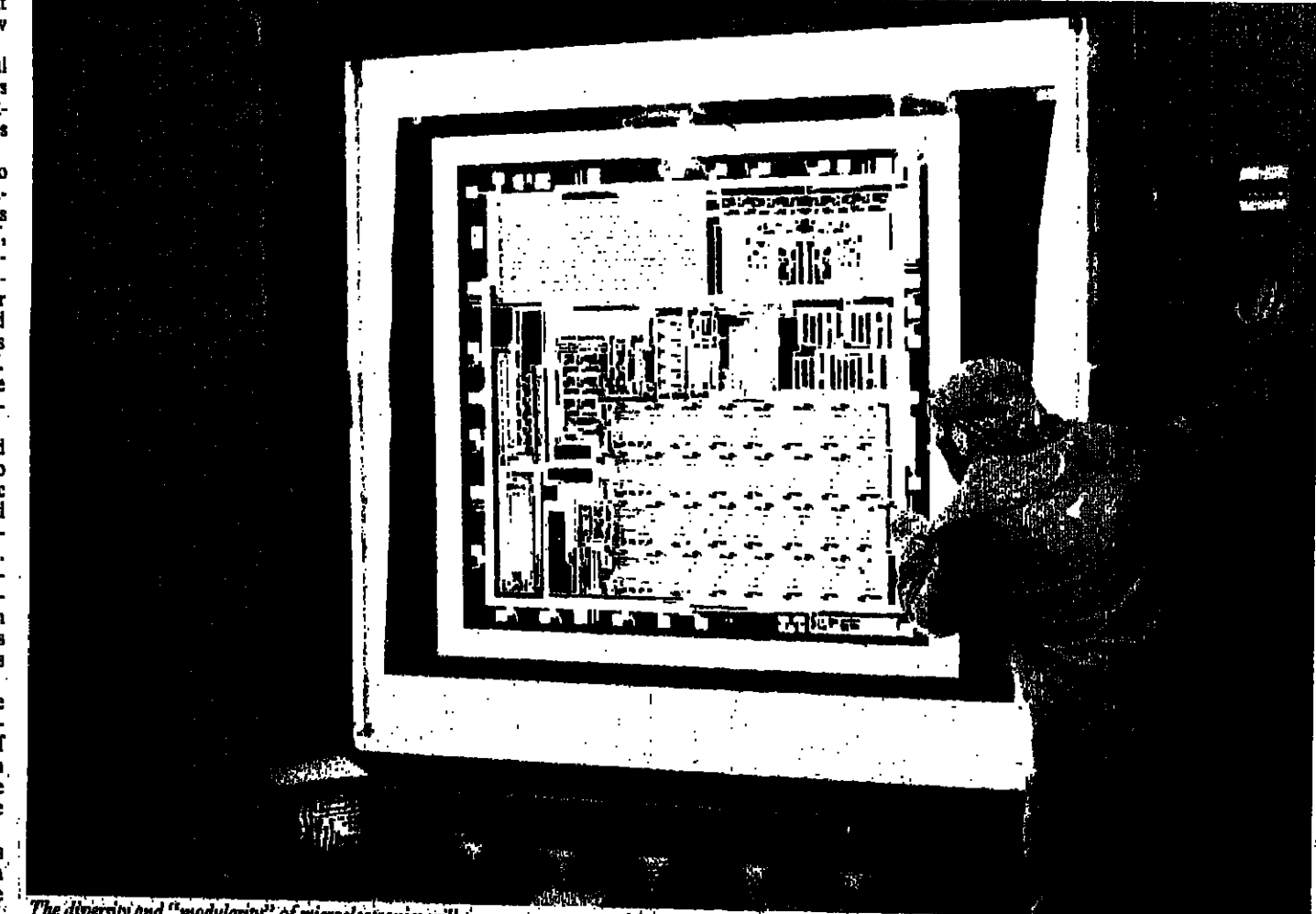
On examining the results of earlier forecasts of the future, one is tempted to conclude that all prognostications are doomed to failure. The future is nearly always shaped by developments and inventions that were totally unexpected.

Look for instance at the global forecasts produced in the 1960s by the world's best-known think tank, the Hudson Institute, and its director Herman Kahn. They were splendid, except that Kahn failed to foresee the oil crisis and the advent of urban terrorism. He might just as well have seen his time growing strawberries.

Still, considering the importance of microelectronics, perhaps further attempts to forecast could be worth the effort. What is needed is a totally new approach, one that is determined to deal in tangibles, and is prepared to tackle such thorny issues as the value of information, and how people acquire their expectations.

Practitioners of the new approach would have to be far better informed about technology, and be ready to assume that it can do anything or has some sinister mind of its own.

This way, and with some luck, they might come up with some predictions that are both right and not obvious - and that would certainly make a change.



The diversity and "modularity" of microelectronics will prevent anyone acquiring a monopoly on it.



"Primary schools will provide the hardest test."



"One thing to put micros in schools, but quite another to incorporate them properly into the curriculum."

## Microcomputer education in Scotland has not lived up to its early promise. David Hearst reports on the reasons

THERE was a time when teachers looked on the arrival of the microcomputer in the classroom as manna from heaven. Gone were the days when the fastest pupil had to learn at the speed of the slowest. Away, too, with the blackboard and chalk and the idea that individual attention was a luxury that only private education could afford. The pupil would from now on be liberated from his class, the teacher from the classroom. Teachers would not so much teach, as manage the machines which allowed the pupils to learn for themselves.

It was heady stuff. But few had any personal experience to draw on and the sales pitch of the mainly American systems designers fell on fertile ground - not only in educational circles.

By the late Seventies, when it became clear that the collapse of our heavy industries was irreversible, politicians were desperate for instant solutions. Nowhere more so than in Scotland, where manufacturing industry in the West was showing all the signs of being knocked for six by the recession.

The microelectronic firms which set up in the East immediately became Scotland's sunrise industry, even though there were still many clouds about.

Schools have always been seen rather glibly as the gateway to the future. In an effort to encourage the supply by creating the demand, government opted for speed rather than caution.

Two months after a survey was carried out on the use of microcomputers in Scottish schools in September 1979, the Scottish Education Department (the equivalent of the Department of Education and Science) invited all schools and colleges to put in their claim for microelectronic hardware. Invent a project, they were told, and we will lend you the machine.

The response was overwhelming. They got bids for over £2 million worth of equipment in a programme that only had £320,000 to spend. No matter, the Scottish Microelectronics Development Programme (SMDP) was well and truly launched.

Micros were lent to over 90 schools throughout Scotland, and by April 1980 when the Scottish Minister for Education and Industry Alex Fletcher announced in Parliament a further £1 million to be spent over four years on the programme, the razzmatazz had become overpowering.

A year later the SMDP's director David Walker could claim: "The microelectronics scene in Scotland is truly dynamic. In November 1979 there were just over 100 microcomputer systems in Scottish schools. Today, 17 months later, there are over 400. Two regions have gone from a nominal involvement to 100% coverage of their secondary schools."

Months later his deputy director had resigned. A preliminary report of an independent evaluator spoke of the lack of teacher training, the widespread sense of isolation and poor communications between the

programme and schools. The fuss that a Press leak created gave rise to months of internecine warfare, with which the world of Scottish education is not totally unfamiliar.

What had gone wrong? From the start, it had become clear that it was one thing to put micros into schools but quite another to incorporate them properly into the curriculum. This needed highly specialised educational software and teachers who were trained to use it.

The SMDP had no say in teacher training, but it had built up the impression that success lay in the number of machines it could distribute, not the use to which they were put. When teachers reported back that they had insufficient software, not enough printers, and poor back-up from the SMDP, the reaction was one of hostility.

At the heart of the trouble was the SMDP's own relationship with schools. Although it described itself as a "pump-priming agency stimulating developments in a selected group of projects", it became clear that the programme had neither manpower nor money enough to be the focus of microelectronic development in schools.

But that had undoubtedly been the original intention. As the independent evaluator Phil Odor, senior research fellow at Edinburgh University, said in his report: "In retrospect, a better model would have been to provide awareness courses and demonstrations of material before equipment was bought, leaving the mass purchase until later."

"One benefit would have been that people would have been more informed in their arguments for correct configurations of machines, having seen the capabilities of them when running programs analogous to the ones the teachers wished to use and develop."

In other words it should have been people before machines rather than the other way round. The consequent raising and falling of expectation brought the danger that schools would be "unable to overcome the prejudices built up during the year or more of inactivity in those members of staff who have drifted away from the project and its aims."

Two and a half years after the micros were put into schools the software library that the SMDP maintains is still slight. Contained in three filing cabinets at its Glasgow headquarters, it is divided into an upper and a lower level - the distinction, being those items whose educational quality are guaranteed, and those which are included for want of anything else which will fit the system.

While there are over 2,000 items in the lower level, there are still only 22 items which the SMDP considers "educationally valuable, adequately documented and technically competent." With only 17 full-time staff and a handful of programmers the upper level of the library is likely to stay that way for some time to come.

Then there are problems with the systems. Now that more machines, like the BBC computer, have begun to appear on the market, there are 14 different systems running in Scottish schools today.

Walker made great play last autumn of the fact that the SMDP managed to get four of the systems, Apple, Pet, 380Z and Cromemco to "talk" to one another but there is still a big problem with compatibility. Even as it is, each system generates graphics in a different way and at the moment they are strictly non-transferable.

The result of the tangle has been that large sectors of Scottish education have gone their own way. Scotland's largest region, Strathclyde, an authority with over half of Scotland's pupils, has opted out of the SMDP altogether, preferring its own scheme and contacts with the Department of Industry in London.

There are now six other centres and committees dealing with computers in education, and although they profess to liaise, consult and observe as a matter of course, the SMDP is losing its place at the centre of the stage.

This is perhaps the worst effect of the last few months' problems for the programme, for although it cannot be blamed for everything that has gone wrong, it was the main channel through which the money and resources went.

The SMDP had started two and a half years ago with the nearest thing to a clear sheet that you are likely to find in Scottish education - isolated groups of enthusiasts scattered around the land, with no-one taking overall command.

The SMDP had an ideal opportunity to take the reins. But now that the DfI is about to announce the extension of its microcomputer grants to primary schools, it is a matter of some doubt how useful the SMDP scheme will be to schools as the DfI's agent.

Primary schools are going to provide the hardest test. Whereas in secondary schools there were teachers who had used micros before an organised system of distribution was set up, primaries are virgin soil.

As the teaching is by class rather than subject, programs that are carefully integrated into the rest of the teaching will become even more important. Being able to play

a space invaders in spelling exercises will not be enough.

The biggest problem will lie with the attitude of teachers. Untrained in the use of educational technology, there is a growing hostility to the introduction of new "specialisms" at a time when old curriculum enrichers like music and craft teaching are being squeezed by the cuts.

It is here that critics feel the SED made its biggest mistake. They feel that the push to introduce microcomputers in schools should have started in the teacher

training colleges. Four of them now have a microcomputer component in their courses, and a teaching qualification in computing is to be introduced.

But the real job lies in retraining the workforce already out in the field, and here the SED and the colleges expect to get a tenth of the money they need.

After only three years one can not expect miracles, say the SMDP's officials. Obviously it will take many years before microcomputers in schools will live up to the exaggerated claims that have been

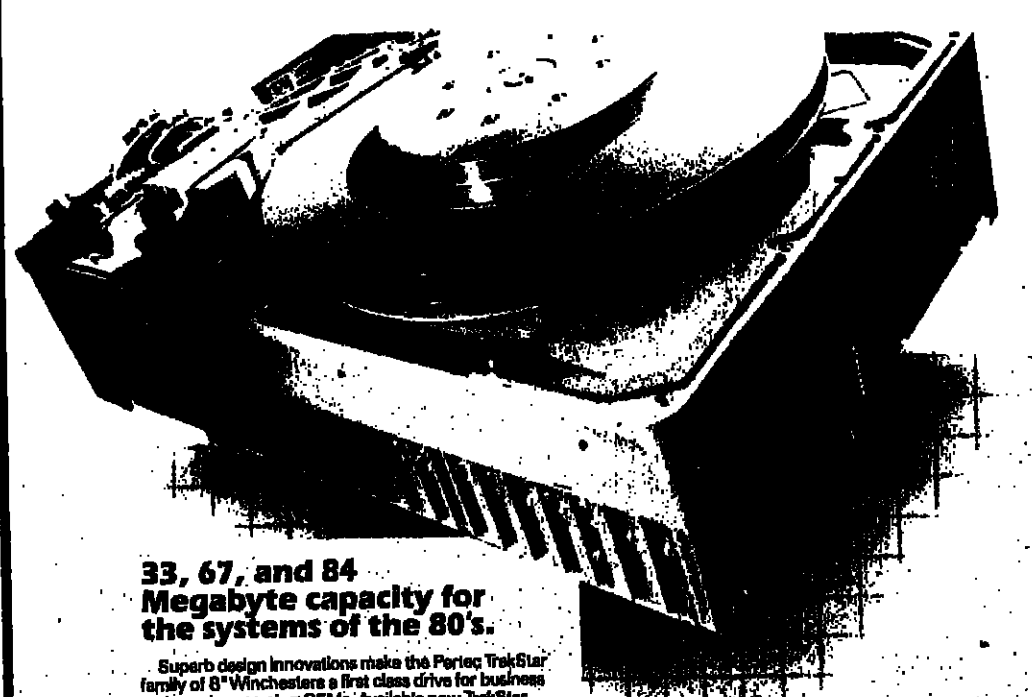
made about them. They can perform stunts, like link a school in East Kilbride up to a European weather satellite, but they cannot as yet lessen a pupil's frustration at reading "ERROR 214" having typed "I" instead of "l".

No miracles - but one could have expected an organised and co-ordinated start to the use of microcomputers in schools and this has not happened.

© The author is education correspondent with *The Scotsman*.

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Berkshire RG3 0DL,  
England. (0734) 852111.



PERFECTING TECHNOLOGY

1079-1276



## Low-price lasers from H-P

A LASER printing system from Hewlett-Packard is claimed to be the lowest-priced high-speed, off-line page print station, using plain paper on today's market.

Priced at £101,760, the HP2685 system is built around the company's laser printer.

With larger quantities of text and business forms stored in its own memory, the print station can deliver finished, printed documents - including logos, forms, signatures, bar codes, and OCR characters - at 45 pages per minute. It can do this at the same time as it is being used to design forms and characters for new applications, says Hewlett-Packard.

HP says the new printer "is a capable, economical device for anyone who has more than one high-speed line printer. One system with two HP2680 page printers could be expected to produce up to one and a half million copies a month. If any user has larger needs, the use of two or more HP2685s could also provide redundancy, for assured uptime. Yet the advantages of low cost



The HP2685 print station.

will be preserved."

The HP2685 print station includes an HP2680 laser printer, an HP3000 computer, system console, operating software, 65.6 Mbyte disc drive, 1600bpi tape drive, and a graphics terminal to design the formats, logos, typefaces and other print features.

Forms and characters may be designed interactively, online, then electronically stored and printed.

Options include a second HP2680 laser printer, high-level programming languages including Cobol and Fortran, a 1600/6250bpi dual-density tape drive, and a 120 or 404 Mbyte disc. The print station can be upgraded to distributed data networking, and supports the several HP3000 word and text processing software packages.

Hewlett-Packard Ltd (CW), King Street Lane, Winnersh, Wokingham, Berks. Tel: (0734) 78774.

## DG adds to its 600 lpm family of band printers

A FAMILY of 600 line-per-minute band printers and printer subsystems has been added to Data General's peripheral product range.

The new printers feature state-of-the-art technology, high-quality printing, and a built-in diagnostic display. Models are available for all Data General Nova, Eclipse and Commercial Systems (CS) computers.

Design features include friction-free hammer actuators, low power consumption and a minimum of mechanical parts which permit cooler operation and increased reliability.

The steel-band mount carrier provides vertical and horizontal registration of characters. The band can be replaced easily, offering users character font flexibility.

An LED diagnostic display records the printer cycle in the event of an offline condition. This display, with a built-in self-test

feature, lets users operate the printers independently of the computer system to correct a number of common fault conditions.

Models 4363, 4364, 4365 and 4366 are designed for operation on Eclipse information systems. Models 9755, 9756, 9759 and 9760 operate on the company's Commercial Systems family of mainframe computers.

All models print high-quality fully-formed characters and report generation. One hundred and thirty-two characters can be printed at 600 lpm on a band ranging from three to 15 inches producing up to six models. Standard pitch is ten dots per inch horizontally, and selectable at six or eight lines vertically.

Data General (CW), Hounsfield House, 724-734 London Rd, Hounslow, Middlesex, TW9 1PD. Telephone: 01-5727403.

## CAD system for PCB design has colour graphics

A COMPUTER aided design (CAD) system has been introduced by Gerber Scientific which is claimed to raise productivity and provide greater control over the design-to-manufacturing cycle of printed circuit boards.

The newest member of the company's family of PCB design systems, the PC-800 Model 3 permits on-screen design of printed circuit boards and incorporates design and production tools such as colour graphics, Winchester drive, design rules checking, on-screen design and component insertion tapes.

PC-800 Model 3 consists of a design console with a 48 cm colour graphics display, 20 Mbyte Winchester drive and on-screen design software. Depending on production needs, the Model 3 can be configured with one of four high-precision Gerber photoplotters, a 107 x 152 cm co-ordinate digitiser

and a variety of output devices. On-screen design features include: interactive connect routing; routing traces from level to level; moving a component and its trace points; inserting multiple trace points without changing the start and end points of an original connect; displaying variable grids on-screen; and multiple lines between pads.

With colour graphics, the Model 3 designer can display, on command, up to eight levels of data.

From a common database, PC-800 Model 3 automatically generates artwork masters, solder masks, pad masters, silkscreen masters, component drawings, parts lists and bills of material, as well as N/C drill tapes and N/C tapes for automatic component insertion and sequencer machines.

Gerber Scientific (CW), Cumberland House, Greenside Lane, Bradford BD8 7BR.



For telex users who employ conventional tape cutters, but who wish to streamline message preparation procedures, Format Communications has introduced a new Videopunch system. The system is designed to bring the advantages of VDU message preparation and editing to telex users at a cost below £2,500. Should a user then want to convert to fully automated telex at a later date, add-on provision is possible. Various configurations of the Format Videopunch are available.

The basic system consists of a terminal with 16K memory and costs below £2,500. At the top end of the range is a more sophisticated system incorporating a mini archiving module, enabling up to 200 messages to be stored on floppy disc for retrieval or standard test storage.

Format Communications (CW), Longbridge Way, Cowley Mill Road, Uxbridge, Middlesex. Tel: (0895) 30678.

## 'Universal' intelligent disc drive

CII-HONEYWELL Bull has introduced the D145 SASI compatible intelligent disc drive. The SASI universal system interface has been accepted as a major standard in today's systems.

CII-HB claims to be the first manufacturer to offer the controller logic in the form factor of its disc drives. The D145 intelligent drive provides the user with 20 Mbytes of formatted online storage with built-in back-up (10 Mbytes removable cartridge plus 10 Mbytes fixed disc). It introduces a series of intelligent drives offered by CII-HB.

The intelligent interface frees the central system from handling the details of drive code and interface protocol. All seeks, verifications, error recovery and other disc control and data transactions are automatically handled in microcode without CPU or bus interaction.

The D145 is priced at £1,860 for quantities of 100.

CII-Honeywell Bull (CW), Kings Wick House, Sunninghill, Berks. Tel: (0940) 23491.

## Starting out alone? Just started a company? Need money?

Getting the right sort of financing for your own company is crucial. Without it a computer supplier, distributor or software house could be a potential world-beater but still flop.

Computer Weekly and Barclays Bank have teamed up to organise a one day conference which will explain how computer industry entrepreneurs can raise money for themselves and their companies.

Speakers will include senior figures from Barclays, from finance institutions and from computer companies which have already been through the experience of raising cash and succeeded. Return the coupon below to book your place and learn from them.

### FIRST TIME FINANCING CONFERENCE

Kensington Close Hotel, Wrights Lane London W8

Thursday, June 17th, 1982

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BARCLAYS

- Chairman, Sir Frederick Wood, Chairman of British Technology Group
- 0830 Registration of delegates
- 0900 Opening remarks
- John MacGregor MP, Paul Under Secretary of State for Industry
- 0915 Keynote: some basic definitions of the sources and kinds of finance
- Sir Frederick Wood
- 0945 The role of the clearing bank
- John Sanders, Manager, Barclays Bank plc, Oxford Street Branch
- 1015 Questions
- 1030 Coffee
- 1100 Non banking finance: venture capital
- Ron Shildon, Assistant Manager, Technical Development Capital, IFC
- John Roberts, Director, United Computers & Technology, how to get backing from the government
- Dr John Parker, Senior Principal Scientific Officer, Dept of Industry
- 1200 Questions and panel
- Speakers from morning
- 1230 Lunch
- 1400 Business Plan: what to prepare and how to present it
- Jon Lovell, Manager, Corporate Business Department, Barclays Bank plc
- Kevin Cahill, Associate Editor, Computer Weekly
- 1430 Raising the money: experiences of two computer companies
- Edric Broadbent, Managing Director, Bionicle Computer Systems Ltd
- Nelson Longford Wood, Joint Managing Director, PME Ltd
- 1530 Tea
- 1600 Cash Flow: how to survive and grow up
- Ron Weedon, Managing Director, Keen Computer Ltd
- 1625 Questions and discussion: bridging the gap between computer companies and financiers
- led by Frank Sumner, Professor of Computing Science, Manchester University
- 1715 Close

Please complete in CAPITALS and return to...

Sue Bennett, Room 1214, IPC Conferences Ltd, Surrey House, Throby Way, Sutton, Surrey SM1 4QQ Tel: 01-643 8040

Please reserve... place(s) for the First Time Financing conference to be held at the Kensington Close Hotel, Wrights Lane, London W8 on Thursday 17th June 1982

The fee is £65 plus 15% VAT (£9.75) per delegate. INVOICE WILL BE SENT. The fee includes morning coffee, lunch, afternoon tea and documentation.

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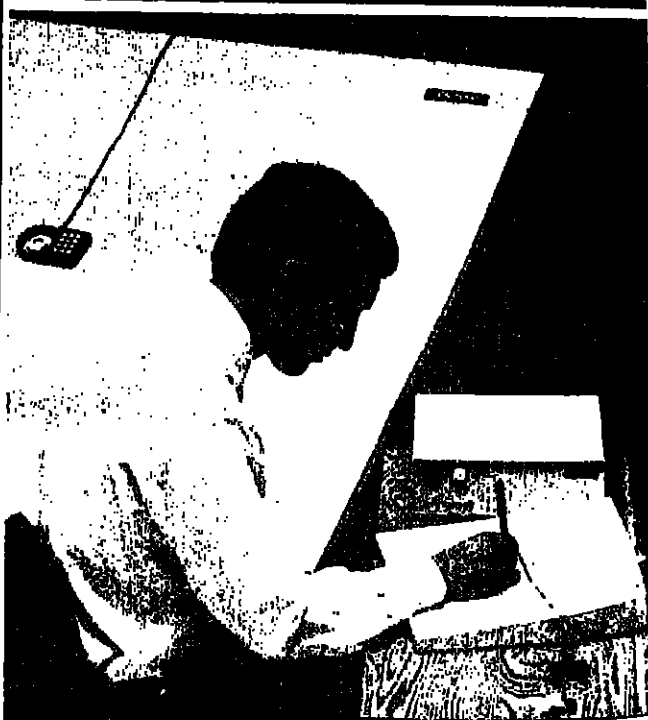
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Calcomp's 9000 Series digitiser being used in conjunction with the Calcomp Wedge for menu selection.

## Calcomp expands its digitiser lines

A RANGE of digitisers, claimed to be more flexible and versatile in configuration and interfacing capabilities than competing units but costing up to 20% less, has been announced by Calcomp.

Designed for use in CAD, mapping, exploration and seismic analysis, the 9000 Series is an addition to Calcomp's existing digitiser lines.

The 9000 Series uses advanced electromagnetic technology with a new type of digitising surface developed by Calcomp's Telsor Digitisers division which allows digitising on conductive materials and is said to provide more precise data input with greater reliability.

Standard digitising accuracy of

the units is  $\pm 0.263\text{mm}$  and they have a resolution of 40 lines/mm.

To increase digitising throughput another new product, the 4000 Series Wedge digitising tablet can be attached for use in such tasks as menu selection. The Wedge is intended primarily for the OEM market as a small digitiser and as an alternative to joysticks, trackballs, light pens and other CRT cursor control devices.

It has an active surface of 11in x 11in, a resolution of 400 lines/inch and selectable output rates up to 240 co-ordinate points per second.

Calcomp Ltd (CW), Coy House, The Rings, Brackley, Berks. RG12 1ER. Tel: (0940) 50211.

### Eight colours on display

ANOTHER model in its ColorScan range of colour display video terminals has been introduced by Mellodata. The new model, the ColorScan 70, is fully compatible with the Dasher video terminal. Models DG100/200 and DG605/233 from Data General.

ColorScan 70, priced at £1,826, allows up to eight colours to be displayed simultaneously.

Mellodata Ltd (CW), Colchester. Tel: 0206-298181.

### 250-character printer

AN extra wide printer for use with the company's range of business systems is announced by MAI (UK).

The new printer, which offers a maximum print width of 250 characters, is designed for use with Dataview word processing software, which has access to word and data processing files.

MAI United Kingdom (CW), Black Arrow House, 7 Charles Road, London NW10 6NW.

## Controller can support up to 31 workstations

A NEW cluster controller for the UTS 4000 terminal family is available from Sperry Univac.

Designated the UTS 4040, the micro-based controller can support directly up to 31 video workstations and up to 48 peripheral devices such as diskette sub-systems and serial and line printers.

Further peripherals may be attached to the workstations. The UTS 4040 is one of the most powerful and flexible controllers now on the market, claims the company. Users can choose configurations to satisfy a wide range of applications using online interactive operation and program and peripheral sharing.

The UTS 4040 has a maximum of 512K bytes of RAM and data storage on double-sided, double density diskettes with one Mbyte capacity. This can be doubled with an expansion drive. Data transmission speeds range up to 19.2K bps.

The basic components of the UTS 4040 consist of a processor, a one Mbyte integral diskette load device, a power supply, communications interface, 64K memory modules, and a workstation interface.

Data transfers between peripherals and main memory are accomplished under the control of dedicated microprocessors. Software support for distributed processing includes a System Control Program which supports concurrent user applications and diskette file management, UTS Cobol (a subset of ANSI X.3.23-1974), and Edit Processor, a Loadable Character Set Generator, and a Text Processing Utility.

Sperry Univac (CW), Centre Point, 103 New Oxford Street, London WC1A 1QC. Tel: 01-836 7717.



ARM 85 video terminal.

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Data Design Techniques (CW), 12 Leasing Road, Borehamwood, Herts. Tel: 01-207 1717.

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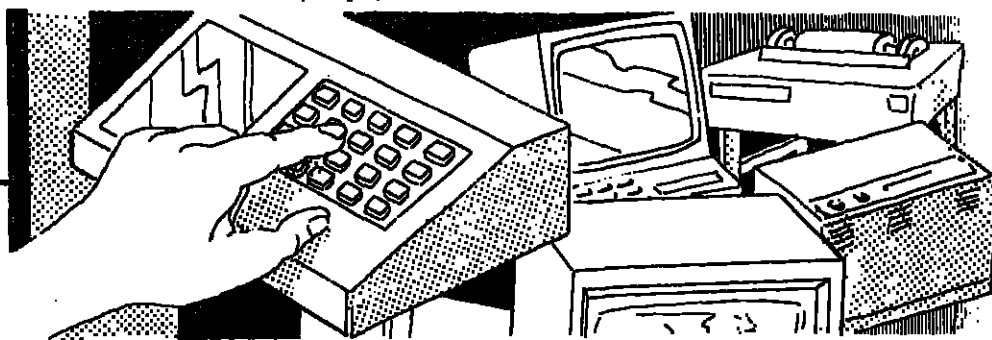
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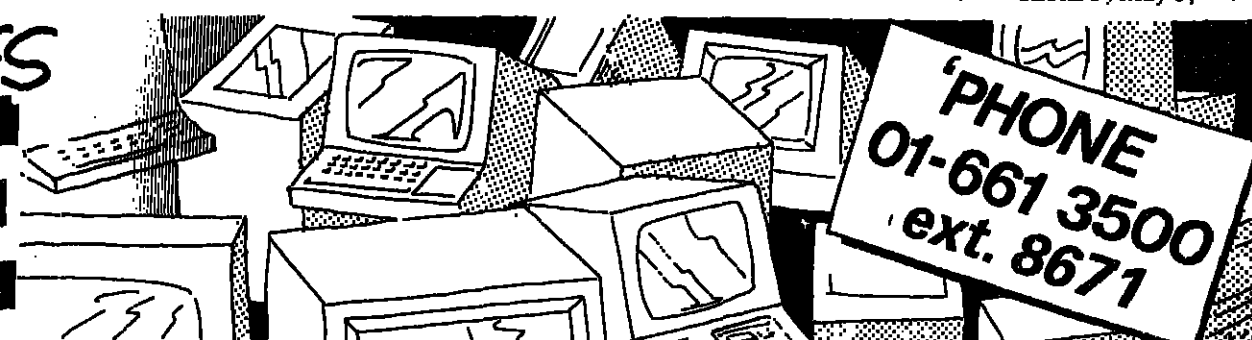
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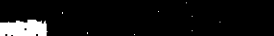


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ICL ME29 COBOL  
ICL TPS

ICL MTS  
ICL Range COBOL

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with DATABOSS

PDP RSX11M BASIC + 2  
VAX or FORTRAN

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DG ECLIPSE COBOL

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TO START  
APRIL-JULY

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A major force in mini systems manufacturing, our client is com-  
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The PROJECT LEADER will be responsible for the analysis, de-  
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**UK base + overseas assignments** base salary to c £16,000  
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Designers and Programmers are currently required in the London  
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Relocation expenses will be paid. This requirement is now very  
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Rates may be negotiable. Contract periods 6-12+ months.

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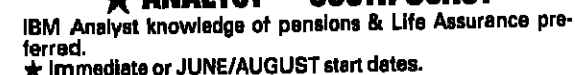
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(0417)

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Applicants will be expected to have worked in a systems programming environment on either an ICL 2800 VME or a DEC VAX 11/780 installation for at least three years and, additionally, have COBOL programming experience.

Application forms can be obtained from the Secretary at Southern Electricity House, Littlewick Green, Maidenhead SL6 3QB (Tel. Littlewick Green 2168 extn. 407) and returned to him quoting 21/82 by not later than May 21, 1982.

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### UNIVERSITY OF LIVERPOOL COMPUTER LABORATORY

#### TWO SECTION MANAGERS AND AN INFORMATION OFFICER

Vacancies exist for a Manager to be responsible for the administrative data processing functions of the University, a Manager to be responsible for the applications section and an Information Officer to take charge of the documentation and other information services of the Laboratory.

The Administrative Data Processing Manager will organise the provision of administrative computing services to the University. These include the financial accounting and payroll systems plus student records and admissions. This Manager will be responsible for the planning of the installation of a new interactive administrative system and the progressive computerisation of the bulk of the administrative activities of the University. The person appointed should be a graduate with some years' experience in computing and of data processing techniques. A relevant postgraduate qualification would be desirable but above all, proven ability in project and staff management is essential for this post. The appointment will be to the academically related staff of the University and to a point on the grade II or III of the R.A. scale.

However, because of the importance of the post, the University is hoping for candidates suitable for appointment direct to grade III.

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WE HAVE CURRENT ASSIGNMENTS, COMMENCING ON OR BEFORE 1st JUNE 1982, WITHIN THE U.K. & WESTERN EUROPE, WHICH INCLUDE:-

HP3000	MPE III	COBOL, IMAGE, QUERY VIEW	PROG & PROG/ANALYST	3 MTHS+
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IBM	MVS/VSAM	COBOL, DL/I, GIS, MIS SYST	SYSTEMS DESIGNERS	LONG TERM
IBM SY538		RPQIII, FOR RPQII-III CONV.	PROG	6-9 MTHS+
ICL SY510	DMF II	ASSEMBLER	ALL LEVELS	LONG TERM
ICL SY525	DMF III	ASSEMBLER	ALL LEVELS	LONG TERM
ICL 2900	VMEB	COBOL	ALL LEVELS	LONG TERM
ICL 2900	VMEB, IDMS	COBOL	ALL LEVELS	LONG TERM
ICL 2900	VMEB, IDMS	COBOL, TPMS	ALL LEVELS	LONG TERM
ICL ME29	TME	COBOL	ALL LEVELS	LONG TERM
MINI		COBOL, DEVELOPMENT	PROG/ANALYST	4 MTHS+
PDP 11	RSX11M	MACRO II & MICRO EXP	PROG/ANALYST	5 MTHS+
PDP 11	MUMPS		PROG	6 MTHS
PDP 11	RTL2		ALL LEVELS	1 YR
MINI/MICRO		COMMERCIAL SYSTEMS	SYSTEMS ANALYSTS	3 MTHS+
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Most important of all, we offer all our Temporary staff the genuine security of a Permanent address. The Temporary Assignment Group are just a phone call away. You will find us surprisingly flexible when we're dealing with your own personal requirements - and you will always find us at home when pay-day comes around.

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061-833 0427

BELGIUM  
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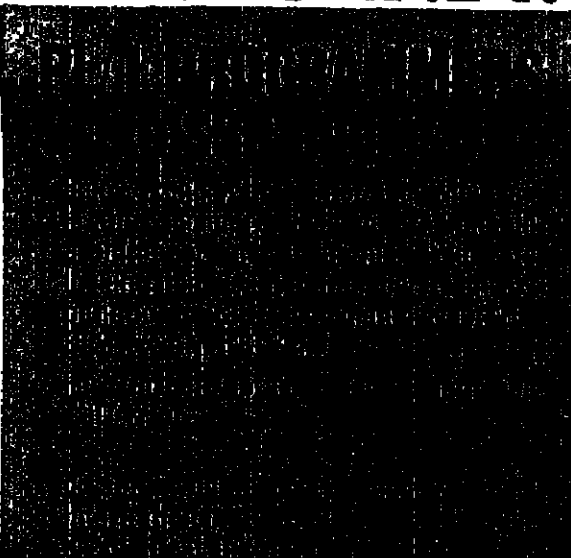
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Salary Scale £2034-£2858 p.a.

Further details and application form can be obtained from the Principal, Suffolk College, Rope Walk, Ipswich IP4 1LT, to whom completed forms should be returned within fourteen days of the appearance of this advertisement. Please send large a.s.e. and quote post number 5.122.

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# SYSTEMS MANAGER

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Our clients are a large public organisation with its Head Office in Warwickshire and some 37 companies located throughout the U.K. They currently seek an experienced data processing person to take responsibility for their computer and systems development.

Throughout some locations mini-computer systems are operational with additional installations already planned. The successful individual will be responsible for completing the implementation programme and will then go on to develop Systems Applications in a wide variety of fields including Financial, Stock Control, Contract Monitoring and other commercial systems.

The job will provide considerable challenge for an individual who wishes to use their expertise within a fast growing environment, and through their own efforts can make a real contribution to the achievement of overall company objectives.

The salary, company car and associated terms and conditions are attractive. For further information male or female candidates should contact Mike Heslin, Reference H88.

S.R. RECRUITMENT



## Cobol CICS Programmer Dublin

The Irish Dairy Board is the central marketing organisation of the Irish Dairy industry and as such has overall responsibility for Dairy Exports. Irish Dairy Products are exported to 80 countries world wide.

The Board has recently installed an IBM 4341 computer and will be making extensive use of CICS. Therefore we require additional programming personnel who will contribute strongly in this area.

It is essential that candidates have at least two years' solid Cobol programming experience along with a proven knowledge of C.I.C.S., showing a potential leaning towards analysis.

These appointments offer exciting and challenging opportunities for career minded individuals wishing to progress in a secure and modern environment. A very attractive salary can be expected with all the benefits associated with an organisation of this nature.

We look forward to hearing from you.

For further details and an appointment, please write to Mike Carr in Dublin or contact Eddie Howard in London.

AN  
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IRISH DAIRY BOARD

Chattan House  
Mount St Lower  
Dublin 4  
Telephone 785788

## Systems Programmer Dublin

STC Documentation Products BV, the European manufacturing base for Storage Technology Corporation of Colorado, USA, currently manufactures a range of high-speed Impact Printers and Tape and Disc Drive units for use with computer systems.

As part of our recently announced major expansion program, the DP facility will shortly upgrade its hardware to an IBM 4341 configuration, operating under VM/DOS/VSE. This will provide sophisticated control systems in an online database environment using CICS and DL/I. At present we are at an advanced stage of implementing IBM COPICS package which will provide an interactive manufacturing control system. To achieve this we are now seeking a Systems Programmer. The successful applicant will have a number of years' relevant systems programming experience OR have a computer science degree.

Salary will be very attractive, reflecting the importance attached to this position. In addition, interview and relocation allowances will be paid where appropriate. If you would like to become part of the exciting and rewarding growth and development of our company, please write or telephone for an application form to:

Les Richards, Manager Personnel & Industrial Relations  
STC DOCUMENTATION PRODUCTS BV  
Jamestown Rd.  
Finglas  
Dublin 11  
or contact Eddie Howard in London.

DOCUMENTATION  
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DUBLIN 11, IRELAND  
TELEPHONE (01) 345333  
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Edmund Howard & Partners

5 Brighton Road, Surbiton, Surrey, England Tel: 01-399 9183

## Systems Analyst Senior Programmer Dublin

AnCo (An Chomhairle Oiliúna, Ireland's Industrial Training Authority, requires a Senior Programmer and a Systems Analyst to carry out designated responsibilities within its Data Processing Complex. AnCO's data processing configuration includes a 4 megabyte VAX 11/780 and a number of ICL mini-computers used in a distributive environment. Software packages currently in use include FIN-PAC, DATARETRIEVE and SPSS.

The Systems Analyst will take responsibility for design, documentation testing and implementing computer based systems for all sections of the organisation. A minimum of three years' Data Processing experience is required on commercial systems and should include overall responsibility for at least one major project.

The Senior Programmer position involves responsibility for meeting agreed performance levels and assisting less experienced programming staff to achieve their targets. He/she will report directly to the Chief Programmer. Candidates should have at least 4 years' commercial programming experience with extensive use of Cobol preferably on disc based systems. Responsibility for at least one major system is essential.

The salary scale rises to IR £12,686 p.a. Contributory pension, sick benefit, spouses' and children's pension and group Voluntary Health schemes are in operation.

Write, call or telephone the Personnel Officer, AnCO, for an application form, or contact Eddie Howard in London.  
All completed applications must be returned by May 21st, 1982.



The Industrial Training Authority  
P.O. Box 458  
27-33 Upper Baggot Street  
Dublin, 4  
Tel. (01) 685777, Ext. 441

## Project Leaders Co. Cork

Mitchelstown is one of Ireland's long-established and best known Agricultural Co-operative Societies. Due to continued automation of business systems the Society plans to install a distributive network of computing; this should take place over a number of years.

To oversee this development, two Project Leaders are required with a minimum of six years' commercial data processing expertise, having implemented at least one major project, preferably as Project Leader.

The Appointees will report to the Group Computer Services Manager and will plan, develop and implement new projects. Particular responsibility will include feasibility studies, user liaison control of systems development projects, work allocation and staff management.

These appointments offer an excellent opportunity to gain additional technical and managerial expertise within a progressive environment. An attractive salary and benefits package can be expected.

For further details please contact:

John Casey  
PRICE WATERHOUSE & CO.  
Gardner House  
Ballsbridge  
Dublin, 4  
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Mitchelstown



## Junior Systems Programmer to join Computer Manufacturer

To £10,000 + Car

London

Currently employed as a Systems Programmer within an end user installation and having gained experience of mainframe operating systems support – you may be seeking fresh challenges where your technical skills can be exploited to the full. Such an opportunity exists within one of Europe's most highly respected computer manufacturers – an opportunity affording much more technical involvement than might be imagined; an opportunity to become recognised as an operating systems expert supporting a field operation and the chance to evaluate new software products prior to general release.

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all aspects of life within the dynamic environment of an expanding organisation, and as such the degree of personal advancement is not merely restricted to the acquisition of technical knowledge – your understanding of the computer industry is general will significantly increase, thus further enhancing your capabilities as a true software professional.

Your hardware background is immaterial – if you are currently biased towards mainframe operating systems support, contact Andrew Carter for further discussion regarding the move to a more exciting opportunity. Telephone 01-935 0671 (24 hour answering service) or submit a curriculum vitae to the London office.

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You are career minded, educated to degree level, with anything between 3 and 10 years' experience in Systems and Programming and are thinking of making your next job move.

As this is very important for you it is worth talking to Shuter Smith **before** you make a move. We are small enough to look after you personally and confidentially and close enough to our clients to be able to discuss their development plans and expectations with you.

We are best able to help people with IBM experience who would like to seriously discuss the current options open to them.

Please call Angela Barrett or Carina Fentum on 01 491 4653.



## Shuter Smith Associates

28, Berkeley Square, London, W1.



01-491 4653

JBA

## Customer Service Specialists – Software Tools

Home Counties £9,000 – £14,000 + relocation

The success of every company, from the smallest to the largest, ultimately depends on the service it provides to its customers. The company we are recruiting for is one of the largest in the High Technology field and currently requires staff in the following Customer Service areas.

### Configuration Management

#### Documentation (Ref TS1)

Responsible for the automated document tracking of all software release and delivery using sophisticated interactive techniques.

#### Software Release/Delivery (Ref TS2)

Co-ordination and manipulation of software on the host computer prior to delivery either to customers or the Testing Group.

#### Implementation (Ref TS3)

Installing, Customising and Training for customers taking their first delivery of the software system.

### Facility Integration Testing

#### Strategy (Ref TS4)

Planning of test requirements for particular items of software. This person may manage the testing group depending on experience.

#### Environment (Ref TS5)

To decide how to carry out testing and to establish the software environment and test data required to ensure systems are tested to the absolute limit.

#### Testing (Ref TS6)

To carry out the tests as defined by strategy and environment providing detailed feedback on test results and testing problems.

There is at least one and sometimes two positions available in each group and all posts require knowledge of an IBM environment using TSO/SPF. The type of candidate most likely to be considered will have had a Systems Software background rather than applications and if you have been involved in designing software then you may have a further advantage. Find out more by contacting me at the address below.

Contact: Tony Staples,  
JAMES BAKER ASSOCIATES  
International Personnel Consultants,  
32 Savile Row, London, W1X 1AG. Telephone: 01-439 9311.

Jeffrey Baker



**HOVLAND**  
BUSINESS SYSTEMS

## Consultants

Windsor to £12,000

This is an exciting opportunity to take total project responsibility within a small, rapidly expanding systems house.

Operating in the field of information technology products and utilising Zynar local area networks, together with IBM systems 23 and 34, the main emphasis will be on:-

- \* Micro based banking Systems
- \* Multi-functional IBM based retail packages

Consultants will be involved in all aspects of project development from feasibility through to implementation, including client negotiations and sales support.

Systems are developed in-PASCAL although there is need for skills in RPG II and BASIC.

Excellent career opportunities based in a picturesque part of Royal Berkshire.

Contact:- David Hendry

Ferguson Thorley Bowles  
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**JBA**

## Software Methods Analyst

Home Counties to £15,000 + relocation

If you would like to apply your knowledge to a wide range of software products then this is an opportunity to join a large multi-national organisation dedicated to the utilisation of the latest state-of-the-art technology.

In order to achieve this goal a specialised group has been formed and its major mission is to define the methods to be used in designing, implementing and controlling new Software development and to define new Software tools to support those methods.

We are looking for someone with a background in some of the following: Quality Assurance; Project Control; Software Metrics; Measurement techniques; Configuration Management; Defect Removal techniques or Standards with an overall knowledge of the Software development life-cycle.

This is a senior post involving a great deal of contact with Senior Management and programming staff.

A salary and benefits package befitting this size of organisation is offered as well as frequent opportunities for overseas travel.

Contact: Tony Staples  
JAMES BAKER ASSOCIATES  
International Personnel Consultants  
32 Savile Row, London W1X 1AG. Tel: 01-439 9311.

## ANALYSTS/PROGRAMMERS £7-11,500 + CAR SCHEME

Our Client is a leading software house specialising in the marine and re-insurance field utilising Hewlett-Packard computer systems. Due to increased demand for their services they now require additional junior and senior computer professionals to work in analyst/programmer or software support roles.

The minimum requirement is 18 months commercial experience in BASIC, SPL, FORTRAN or any other block structured language, together with a good academic background. Any knowledge of Hewlett-Packard systems and software would be advantageous but not essential as training will be given where necessary. Candidates can expect a high degree of client contact and must therefore be professional in both appearance and attitude. Some travel will be required between the Company's City office and their head office based in an easily accessible part of South Buckinghamshire.

In return our Client offers an excellent starting salary and package which includes an annual bonus, flexitime, pleasant working conditions and company car scheme. If you are self motivated and looking for a challenge in a dynamically expanding environment contact Apex quoting ref. MH/04 for further details.

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Call Diana today on 01-437 3942 regarding above requirements.

## TEAM LEADER

London £10,000 (neg)  
We are an internationally recognised Systems house, currently involved in the recruitment of an experienced person to play a key role in a major new project. It is essential to have a sound background in COBOL programming coupled with supervisory skills and proven design ability. Knowledge of Banking Systems and/or Honeywell Level 8, would be a definite advantage. For further information please contact our advising consultant Janet Chilvers on 01-437 3942.

**Babage**

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## Systems and Software Engineer

Salary Negotiable Rural South Midlands

A major engineering company, having successfully branched into automated testing equipment for industry, is expanding the specialist DP Department and has asked BLACKWOOD ASSOCIATES to assist in the recruitment of some additional Systems and Software Engineers.

The successful applicant will join a small team working on real-time systems and will be involved from the initial hardware recommendations, through software programming, to integrated testing of hardware and software.

It is essential that applicants should have the ability to communicate effectively with client users, a knowledge of engineering procedures and preferably experience of a high level language in real-time applications.

Generous relocation assistance will be given where necessary.

Contact Theresa Whitty on 021-233 2921, quoting Ref. SE104.

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## SWITZERLAND MAINFRAME SOFTWARE PROGRAMMERS

Our client is introducing a new high-level language for large scale Software productions. An additional programmer is required to develop Software tools, debugging systems and utilities.

Successful candidates should have a degree in Computer Science, 2 years' of IBM or UNIVAC, used modern high-level language and have been involved with large Software development projects. Ref CW 10/1

## SATELLITE COMMUNICATIONS - INTERNATIONAL

A Software engineer is required by our client to join a small team developing this new and very exciting area of communications. Candidates should be in their mid to late 20s, a background degree in electronics or related subject, 2 years' experience of assembler plus a high-level language and ideally a mixture of PDP11 and INTEL experience. Ref CW 10/2

## SCIENTIFIC PROGRAMMERS - LONDON

An expanding division of a well-known Software House have immediate openings for the following projects:

Real Time Simulation, Process Control, CAD, Command + Control and Mathematical Modelling. Successful candidates should have one or more of the following: Minimum 2 years' Software Programming, PDP11, RSX11M, VAX 780, ASSEMBLER, CORAL 66, RTL2 and FORTRAN. Ref CW10/3

## SWITZERLAND

## GERMAN SPEAKING SOFTWARE ENGINEERS

A major communications company require additional German-speaking programmers, to develop new communications Software. Candidates should have a minimum of 2 years' Real Time experience in this field. Ref CW10/4

## HARDWARE ENGINEER - INTERNATIONAL

Satellite communications is our client's speciality. They currently wish to employ a Hardware Engineer with a minimum of 3 years' experience in industry. A degree background is necessary plus some involvement in Software Hardware experience of TTL and ECL design on micros would be ideal. Ref CW10/5

## ASHFORD SOFTWARE ENGINEERS

A company dedicated to Communications Systems is currently seeking engineers with a variety of the following:

- IBM/ICL PROTOCOLS
- DEC/RSX11/VAX
- CORAL
- NETWORKS
- EMULATORS
- X25
- DEFENCE
- INTEL 8086
- PROCESS CONTROL

Ref CW10/6

## FRANCE IBM SYSTEM PROGRAMMERS

One of France's largest Computer Services Companies have openings for IBM Systems Programmers to work on a variety of our client's installations in a Systems engineering role.

Knowledge of French would be helpful, though a willingness to learn French is essential. Technical experience must include a minimum of 2 years' MVS experience plus related Software Tools. Ref CW10/7

## OPERATIONS RESEARCH PROGRAMMER/ANALYST

Our client's London-based operational Research/Scientific Systems group is currently seeking programmers with the following expertise:

- FORTRAN
- MVS/TSO
- Min. 2 yrs' exp.
- IBM
- Honours Degree
- Financial Planning

Ref CW10/10

## SWITZERLAND SENIOR SYSTEM ENGINEER

### DATA/PACKAGE SWITCHING

An experienced Systems Engineer is sought by our client to develop Data Switching/Package Systems switching from design to implementation.

Candidates with the following experience should apply:

- Degree, preferably MSC
- Minimum 5 years in Real Time
- Minimum 3 years in Telecom
- Direct experience of Design and Implementation of High Speed, Data Switching, involving CCITT recommendations X21 and X25
- Experience of Local Area and private networks, preferably public synchronised data switching
- High level languages i.e. ALGOL, CORAL, PASCAL or CHILL

The successful candidates must be self-motivated able to work on his or her own and adapt to modern QA Techniques.

This is a highly responsible position carrying job satisfaction and generous remuneration for the right level of experience. Ref CW 10/12

## COMMAND & CONTROL LONDON

One of the largest International Software houses with their headquarters in London have a requirement for Software Designers with a minimum of 1 year's experience in Real Time Systems Design, candidates should have a degree plus experience in one or more of the following:

- Defence Systems
- Mascot
- PDP11
- CORAL
- VAX
- INTEL 8086

Ref. CW/11

All the above appointments involve permanent positions and carry a wide range of salary and conditions dependent on location and experience. In the first instance please send us a copy of your CV (alternatively telephone for an application form) so we may discuss your application in confidence with our client on your behalf.

**DATAMATICS**  
RECRUITMENT SERVICES

01-399 9183

Datamatics, Freepost, Surbiton, Surrey KT6 5BR

## INTERNATIONAL

### TELECOMMUNICATIONS

A London based consultancy require experienced candidates with a minimum of 4 years telecommunication experience, to work in an English speaking project in Italy or Spain. Successful candidates will be expected to become Team Leaders after a fairly short period. Experience with System 12, CHILL, ASSEMBLER, FORTRAN, EBM/TSO and networks would be ideal. CW 17/1

## SOFTWARE ENGINEERS

Our client applies traditional engineering disciplines to Software Design and Production. Their applications include Weapons Guidance, Satellite Communications, Mathematical Modelling and Systems Simulation. Candidates with compatible experience to the above applications will gain a remarkable breadth and depth of knowledge, not just on a theoretical basis but through practical experience, and close involvement in some of the most advanced Real Time Systems anywhere. CW 17/2

## SOFTWARE ENGINEERS

Our client, a growing Computer Manufacturer, is seeking candidates to interface between Marketing and Systems Design. Candidates should have a technical background including 2 years programming and must be able to communicate in English both written and verbal, and have a desire to become involved with technical writing. Our client's business involves the latest technology including Micro Processors, Data Communications and Local Networks. CW 17/3

## SOFTWARE ENGINEERS

Our client is acknowledged to have one of the world's foremost Research and Development establishments in the field of Telecommunications. They are currently developing a Digital Exchange for office and factory use.

They wish to recruit Software Personnel who like working in relatively small projects, with a minimum of supervision and enjoy exposure to hardware.

Candidates should have a Degree, 2-4 years experience of Real Time Software Development preferably in Telecommunications. CW 17/4

## SOFTWARE ENGINEERS

One of the UK's largest Systems Consultancy and implementation organisation's offers an exceptional combination of involvement, experience and commitment in a number of specialised application areas. They are looking for System Engineers to undertake an initial assignment in Europe working at the design stage of a Real Time project. Candidates should have:

- A minimum of 5 years experience
- Specialised knowledge of Fire Control Systems
- Guidance systems
- Radar/Sonar
- Navigation or EW Systems

CW 17/5

## TECHNICAL

### SALES SUPPORT

With the signing of another large military contract, our client is urgently seeking Systems Engineers to become involved in Technical Support. Ideally candidates will have a Degree or an education from within the services. A number of candidates are required to become involved in the following:

- Pre & Post Sales
- Sales Schedules
- Proposal Writing
- Project Management
- Technical Control
- Commissioning

Successful candidates should enjoy combining a Software Engineering background or military applications with technical support and customer contact. CW 17/6

## SWITZERLAND

### QUALITY ASSURANCE

One of our clients requires an experienced Software Engineer with recent involvement in quality assurance. The successful candidate should be experienced in writing and enforcing standards. Candidates should have sufficient German to communicate within a German Speaking Project. There is also an additional opening within the same project for a quality integration and testing position.

In this case, candidates should have extensive experience of Testing, Documentation, Implementation, and Commissioning of Customer Sites. CW 17/7

## SYSTEMS CONSULTANTS

### LONDON

Our client, a leader of International Business Communications, requires additional Systems Consultants to work from their London base with occasional overseas travel possible.

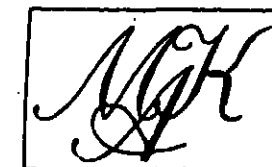
Systems Consultants will be involved in System Design for a variety of industries using new technology involving video communications on Real Time Systems.

Candidates should have experience of DEC, VMS or RSX11 ability to design Software for a wide range of terminals and networks. CW 17/8

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The Company offers a most comprehensive benefits package, but more important is the growth potential in an **expanding, progressive and international environment**.

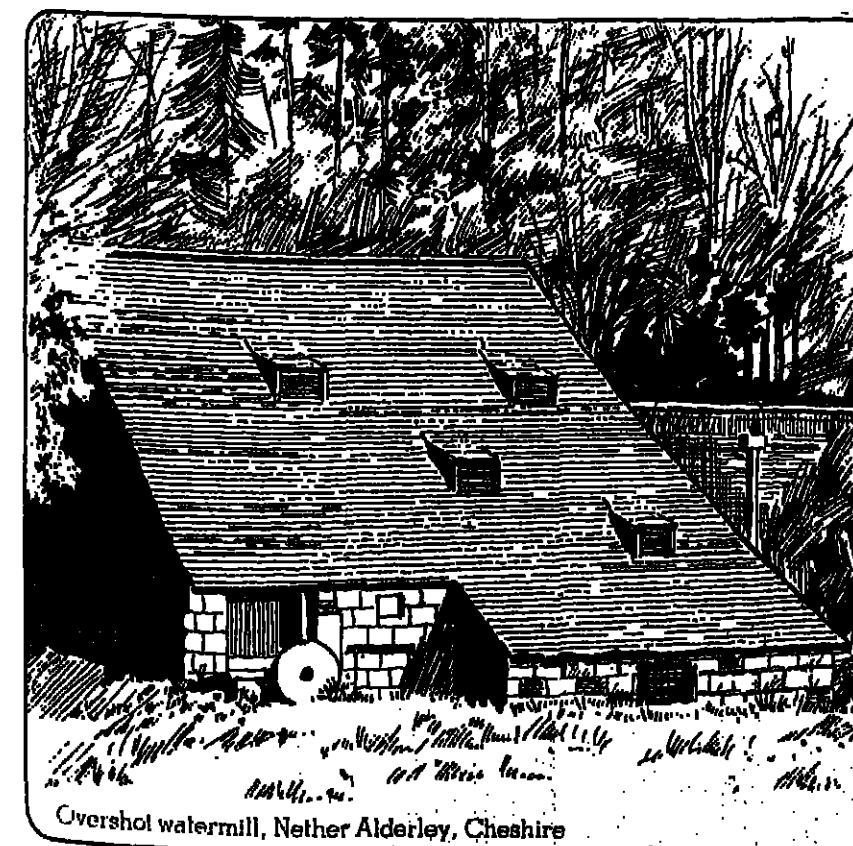
If you can fulfil this challenge, then I would like to meet you for an initial informal discussion. Please telephone, in confidence, **JEFF BOWMAN**, either at the office (0905 28469); or at home, evenings/weekends, on 0905 67457.

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Rural

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## THE POSITION

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- Network Design.
- High level network trouble shooting.
- Provision of network control procedures for the Division.
- All aspects of datacommunications software for the various machines.
- Evaluation of terminals.

## EXPERIENCE REQUIRED

Preferably five years experience of data-communications and networking and an aptitude for systems programming. Additionally experience of Local Area Networks, evaluating terminals and at least one of the Divisional computers would be an asset.

## BENEFITS

In addition to the salary (currently under review) other benefits include up to five weeks holidays, profit sharing and bonus payments, an attractive relocation package and good career prospects.

## THE INSTALLATION

Divisional Headquarters operate a number of computers with around 400 terminals together with all the systems software and hardware associated with one of the UK's largest pharmaceutical research and production operations. The Division's computers include a dual processor B 7800, a B 6900, ME 29's, HP 1000 and PDP 11's. There are connections into corporate network machines including AMDAHL, IBM, DEC and PRIME via a TRAN switch.



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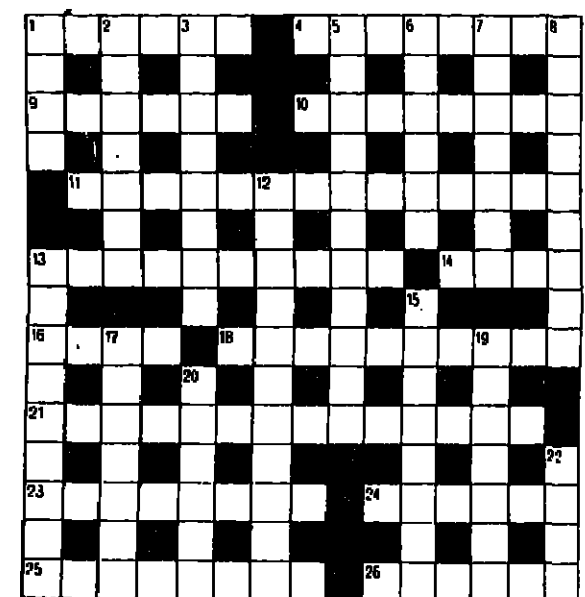
Jeff Bowman



**CROSSWORD****Prize Crossword No 28**

Compiled by Alec Robins

A prize of £10 will be awarded for the first correct entry opened. The second and third solutions opened will receive £5 each. Entries to Crossword Competition, Computer Weekly, Quadrant House, The Quadrant, Sutton, Surrey, SM2 5AS, by first post Friday, May 14. Please use a ballpoint to complete the crossword, and include a telephone number at which you can be reached during the daytime.



Name..... (Miss, Mrs, Ms, Mr)

Address.....

Telephone.....

I accept the rules and conditions of the Computer Weekly Crossword Competition.

Signed..... Date.....

**ACROSS**

1. Sarah in the morning is given one sausage (6)
4. A good sport to face the bowler and hostile missile (8)
9. Mother gets request for figured material (6)
10. Throughout existence I was conscious of falling short in desire (8)
11. Below the others? The king isn't, commonly, restricted (5,9)
13. A Scot, one having to live right next to a fellow Scot? (10)
14. Fancy hose in which there's usually a sock (4)
16. Urgent message about Party's leader giving bribes (4)
18. Still a type of debate with nothing to voice on? (10)
21. Ask me in, Ma - I flog sensational indigestion potion (4,2,8)
23. Lotion makes small car return in fast time (8)
24. Is skulking inside depressed, cast off (6)
25. Unfolds drama in a Norfolk town (8)
26. Silver for spy - that's about right (6)

**DOWN**

1. Notice very big rising, making a splash? (4)
2. Disappointing outcome of French seen in their newspaper (2,5)
3. Draws into error with a wry sad smile (8)
5. Restoring to former position, and setting forth under control (11)
6. Shout about the girl bringing fruit (6)
7. Fond of good literature? All right, I dip into rubbish (7)
8. A tense condition, intoxication? (9)
10. Mayor's men on rampage - it may help to get one's own back (6,5)
11. Met a fool - upset me - dripped blood (9)
15. Deduce one alternative is poorer (8)
17. Wooden stakes Dad's put round the heather (7)
19. An interesting incident is written into a lyric poem (7)
20. Ceremonious, because master precedes the sovereign (6)
22. A fool, by the sound of it, to do needlework (4)

**RULES AND CONDITIONS**

1. Each competitor may submit no more than one entry.
2. The competition is open to all readers of Computer Weekly with the exception of the staff of IPC Business Press Ltd, any printers employed by them or their relatives of any such staff.
3. The solution of each puzzle will normally be published in the issue three weeks after the puzzle has been published.
4. Winners will receive their prizes during the month following the competition.
5. The decision of the editor on the interpretation of the rules and conditions and on all matters shall be final. No correspondence will be entered into.

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**SENIOR SYSTEMS PROGRAMMING OPPORTUNITY IN LEEDS**

The Leeds Permanent Building Society is seeking to recruit an experienced Senior Systems Programmer to join the Management Services Team at its Leeds Head Office.

The Society has a large computer centre in Leeds and terminals in more than 300 branch offices throughout the UK. The MVS operating system supports both IBM 3031 processors at the centre and plans are well advanced for major changes to the central site and on-line systems.

**SENIOR SYSTEMS PROGRAMMER**

A vacancy exists for a Senior Systems Programmer with several years sound experience of large IBM computer installations. A detailed understanding of MVS is particularly relevant. A knowledge of CICS, telecommunications software and data base techniques is also applicable.

This is an excellent opportunity to extend technical and management expertise. The successful applicant will play a leading role in this demanding and progressive installation.

**BENEFITS**

A competitive salary is offered and training will be provided on a continuing basis. A wide range of additional benefits include a staff mortgage scheme, pension, life assurance and sickness schemes, subsidised staff restaurant, and sports and social facilities.

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(8314)

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Applications from experienced programmers with a minimum educational attainment of HNC or equivalent are preferred but persons without experience may apply for appointment as trainees.

Application forms may be obtained from: The Administrative Officer (Personnel), Napier College of Commerce and Technology, Colinton Road, Edinburgh EH10 6DT.

Closing date for application is 14 May 1982.

(8450)

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The successful applicant will be able to work on his/her own initiative and will have reached a reasonable educational standard. He/she will feel at home within a data processing environment, will be able to write clear and concise reports on complex topics and will be able to communicate easily at all levels.

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The company has an excellent track record in marketing its service and past clients include many household names. Company growth has been rapid and further expansion is planned.

An excellent basic salary plus commission is offered and should lead to a package of around £20,000 pa on quota earnings. A company car and full benefits package are also provided.

If you have the commitment to succeed and a desire to work within a small enthusiastic sales team then we would like to hear from you.

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If you are 28yrs to 40yrs, and feel you have the commercial flair and maturity to perform this "Consultancy" role we would like to hear from you.

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**SALES BIT**

Quality of management - 8

**Overworked? - It's probably your own fault!**

I BELIEVE it was Peter Drucker who observed that overwork is the greatest cause of management inefficiency. Yet, like some pieces of obvious commonsense, it is a reality that goes unnoticed by a large proportion of the executive population.

If you are a manager and believe that you are overworked, consider the reasons why. The chances are you will come up with a long list: understaffed, state of the market, poor support from other departments, inadequate superiors, seasonal peak, lack of finance, product difficulties, etc.

Your list will not include anything as self-critical as inadequate personal organisation, but most cases of overwork are the result of had planning related to the working day.

Consider for a moment the direct cost to your employer of utilising your services.

If the costs for your salary and commission are £20,000, the chances are that the addition of overheads, expenses, and company car will bring the total to roughly £24,000.

That's a very convenient figure when one considers there are approximately 240 working days in a year.

However, many companies do not regard remuneration as the real cost of a sales manager. He or she is seen in terms of negative revenue. When sales managers achieve or exceed revenue target, they cost "nothing". If further performance is less than expected then that is the price the company pays.

I have heard it said that some American companies install digital time/cost clocks into management meetings and conventions which declare the cumulative cost to the company of the executives involved. The intention is to motivate the participants into the most efficient use of time.

It would be interesting to install a time/revenue clock in the sales manager's office declaring the cumulative revenue value as each minute passes - but I am sure the effect would be entirely negative.

Badly organised managers can usually be identified by their continuing need to work overtime and the air of panic that surrounds most of their activities. "Management disaster" is the modus operandi and "headless chicken mode" the executive style. Such people say they enjoy the adrenalin flow of operating right up to the deadline, everyone working at high pressure, labouring into the early hours!

Well, it may give the manager a buzz, but for the staff it is likely to be a pain in the neck they would rather be without.

So, what is to be done? The answer is rather more than simply an awareness of the cost of time spent on the job. The real payoff is in effective time planning and personal organisation. The typical sales manager loses most of the working day through interruptions and meetings. The application of firm discipline in these areas can bring great rewards.

Letting your office door permanently open can be a laudable piece of North American democracy, but it also serves to generate unnecessary interruptions from subordinates, visitors and all other forms of shop.

Let people know that you will always make yourself available, but on your terms not theirs. Just think what you could achieve if your interruptions were reduced by 50%. Use your secretary effectively, stating your plans and making it known when you accept calls and from whom. The increase in your working efficiency could be quite considerable if your efforts are limited to this area alone.

Meetings? Well we all know about them! Meetings tend to lose their usefulness at an exceptional rate after about two hours. The application of a time limit tends to instil a higher degree of urgency and objectivity to the attitude of participants.

Just like sales-calls, people tend to agree a start, but no finishing time. That's bad planning!

If you want to maximise the use of your time always insist on a finishing time for all meetings. You may not achieve a prompt conclusion on every occasion, but when people know they have run out of time it tends to focus their thinking.

There are other areas where time can be saved: travelling, correspondence, effective delegation and so on - but the effective use of management time means more than increasing the efficiency of existing activities. There are other essential functions of management that are likely to be overlooked because of pressure from other quarters. Planning, self-evaluation, creative thinking, and relation.

These are important aspects of management that must be given individual exposure during every working week. Without these the manager becomes a stagnant automaton who is neither developing nor working to maximum potential and probably destined for a nervous breakdown, a heart attack, or even both.

That's a terrible price to pay for failing to realise one's real potential.

So, next time you take a pile of work home for the weekend and your spouse happens to mention how easy it is to get a divorce these days, do take time to plan your business activities more effectively.

Alan Williams

**PUZZLE****ANSWER**

WHEN one looks at the first two equations, it becomes clear that the pair of factors giving 288 must have the same sum as the pair of factors producing 328. The only two factor-pairs that meet this condition are 8 x 36 and 6 x 39.

This leaves us with (8 + 36) + C = 448. Here again the knowledge that the factor-pair sums to 44 is valuable, and the remainder of the solution turns out to be C = 10; D = 20.

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